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TABLE OF CONTENTS

MEDICINE—Internal Diseases, Pediatrics, Neurology, Diagnostic Methods, Etc.

The Importance of a Knowledge of Syphilis to the Internist. Ernest B. Bradley, Lexington, Ky. 91

Discussed by Henry A. Christian, Boston, Mass.; J. B. McElroy, Memphis, Tenn.; Ellsworth S. Smith, St. Louis, Mo.; M. L. Graves, Galveston, Tex.; F. Walter Carruthers, Little Rock, Ark.; William deB. MacNider, Chapel Hill, N. C.; Tom A. Williams, Washington, D. C.

A Physiologic Basis for the Treatment of Chronic Constipation. Horace W. Soper, St. Louis, Mo. 99

Discussed by George M. Niles, Atlanta, Ga.; J. Rawson Pennington, Chicago, Ill.; J. G. DuPuis, Lemon City, Fla.; J. C. Johnson, Atlanta, Ga.; Robert B. James, Danville, Va.

A Study of the Reactions Following the Transfusion of Blood. Paul W. Clough and Mildred C. Clough, Baltimore, Md. 104

Discussed by James S. McLester, Birmingham, Ala.; J. E. Paullin, Atlanta, Ga.

On the Administration of Digitalis to Children with Diphtheria. Hugh McCulloch, St. Louis, Mo. 110

Discussed by W. McKim Marriott, St. Louis, Mo.; McGuire Newton, Richmond, Va.; L. T. Royster, Norfolk, Va.; L. R. DeBuys, New Orleans, La.; S. A. Visanska, Atlanta, Ga.; H. M. Austin, Laredo, Texas.

Report of a Case of Formalin Urticaria. J. De'Voine Guyot, Bucklin, Mo. 115

TROPICAL DISEASES AND PUBLIC HEALTH

Health Insurance. Frederick R. Green, Chicago, Ill. 116

Discussed by E. A. Hines, Seneca, S. C.; James A. Hayne, Columbia, S. C.; Hugh Cumming, Washington, D. C.; Frederick L. Hoffman, Newark, N. J.; A. T. McCormack, Louisville, Ky.

SURGERY—Railway, Industrial, Gynecological, Obstetrical and Urological

Surgical Monstrosities and Monster Growths. Lucian H. Landry, New Orleans, La. 132

Concluded on next page

Surgical Diagnosis and Treatment

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TABLE OF CONTENTS—Concluded

The Incidence of Kidney Infections in Acute Appendicitis. R. M. Harbin, Rome, Ga. 139

Discussed by M. Y. Dabney, Birmingham, Ala.; LeRoy Long, Oklahoma City, Okla.; A. L. Blesh, Oklahoma City, Okla.; M. F. Bledsoe, Port Arthur, Texas; Richard A. Barr, Nashville, Tenn.; A. J. Crowell, Charlotte, N. C.; Mischa Casper, Louisville, Ky.; William T. Black, Memphis, Tenn.; W. P. Harbin, Rome, Ga.

Ureteral Calculi. A. J. Crowell and Raymond Thompson, Charlotte, N. C. 144

Discussed by John H. Neff, University, Va.; J. L. Boogher, St. Louis, Mo.; H. W. Walther, New Orleans, La.; W. A. Frontz, Baltimore, Md.; Raymond Thompson, Charlotte, N. C.; H. A. Fowler, Washington, D. C.; George R. Livermore, Memphis, Tenn.; Lucian H. Landry, New Orleans, La.; A. L. Blesh, Oklahoma City, Okla.; F. Webb Griffith, Asheville, N. C.

Nonunion of the Humerus: Repair by Means of the Bone Graft. M. S. Henderson, Rochester, Minn. 148

Discussed by J. Spencer Davis, Dallas, Tex.; W. Russell MacAusland, Boston, Mass.; William S. Baer, Baltimore, Md.; Charles C. Garr, Lexington, Ky.

Prenatal Supervision. Quitman U. Newell, St. Louis, Mo. 155

Discussed by George Clark Mosher, Kansas City, Mo.; W. H. Vogt, St. Louis, Mo.; R. E. Wobus, St. Louis, Mo.; C. R. Hannah, Dallas, Tex.; M. Pierce Rucker, Richmond, Va.

EYE, EAR, NOSE AND THROAT

Unrecognized Glaucoma and the General Practitioner's Responsibility in Its Diagnosis. Hiram Woods, Baltimore, Md. 160

Discussed by J. A. Stucky, Lexington, Ky.; J. W. Jervey, Greenville, S. C.; Meyer Wiener, St. Louis, Mo.; J. A. White, Richmond, Va.; H. H. Briggs, Asheville, N. C.; E. H. Cary, Dallas, Tex.; Hilliard Wood, Nashville, Tenn.

An Atypical Mastoiditis Following a Staphylococcemia. H. Marshall Taylor, Jacksonville, Fla. 167

Discussed by John J. Shea, Memphis, Tenn.; H. H. Briggs, Asheville, N. C.; Clifton M. Miller, Richmond, Va.; J. A. Stucky, Lexington, Ky.; W. W. Black, St. Louis, Mo.

EDITORIALS 171

BOOK REVIEWS 178

SOUTHERN MEDICAL NEWS 178

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Wm. H. Park, M. D.
Charles Krumwiede, M. D., Assistant Director of the Bureau of Laboratories, New York City.
Geo. A. Soper, Ph. D., Major, Sanitary Corps, U. S. A.
W. L. Dodd, Assistant Director, Department of Sanitation of the Pease Laboratories, N. Y.
C. E. A. Winslow, Dr. P. H., Professor of Public Health, Yale School of Medicine.
Lawrence Veiller, Secretary of the National Housing Association, N. Y.
Edward K. Dunham, M. D., Lt.-Colonel, Medical Corps, U. S. A.
Alfred F. Hess, M. D., Clinical Professor of Pediatrics, New York University and Bellevue Hospital Medical College.
J. P. Atkinson, M. S., Chief Chemist, Department of Health, N. Y.
Arthur R. Guerard, M. D., Lecturer on Social Hygiene, New York State Department of Health.
James T-B. Bowles, B. S., Lecturer in Water Supply and Sewage Disposal, New York University, Department of Hygiene, Bellevue Hospital Medical College; formerly in charge of Water Supplies and Purification Plants, Canal Zone, Panama.
Wallace A. Manheimer, Ph. D., Vice-President of the International Congress on Public Baths, Belgium, 1920.
Eugene Lyman Fisk, M. D., Medical Director of the Life Extension Institute, N. Y.
C. W. Berry, M. D., Lecturer on Military Hygiene, New York University and Bellevue Medical College; Brigadier-General, N. Y. National Guard.
Frank Overton, M. D., P. H. Se.C., Sanitary Supervisor N. Y. State Department of Health.
M. F. Connor, M. D., Health Officer, Panama Canal, 1904-1914, Senior State Director, International Board.
William H. Guilfoy, M. D., Registrar of Records, Department of Health, New York.
Louis I. Harris, M. D., Director of Bureau of Preventable Diseases, N. Y. City; Medical Advisor to the Labor Sanitation Conference, Greater New York.
S. Josephine Baker, M. D., D. P. H., Director of Bureau of Child Hygiene, Department of Health, New York; Consultant in Child Hygiene, U. S. Public Health Service.
Charles F. Bolduan, M. D., Chief of the Section of Public Health Education, U. S. Public Health Service.
August Hoch, M. D., late Director, Psychiatric Institute, Manhattan State Hospital for the Insane, New York.
Henry H. Goddard, Ph. D., Director of Bureau of Juvenile Research, Columbus, O.
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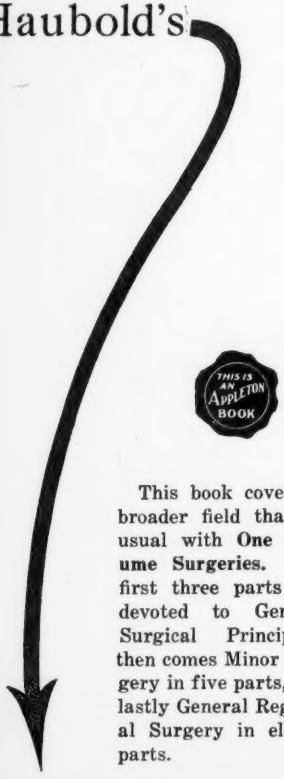

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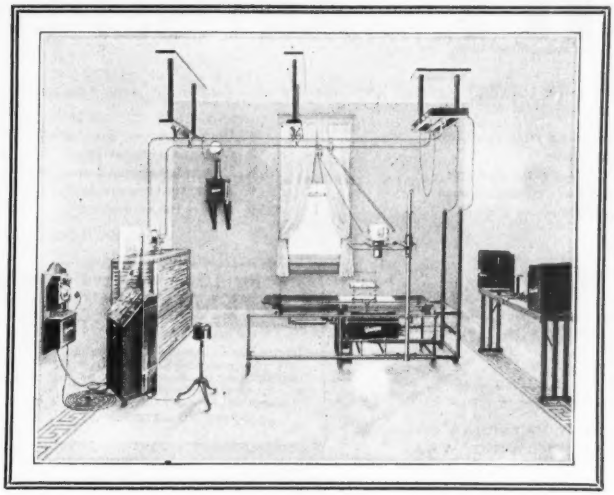

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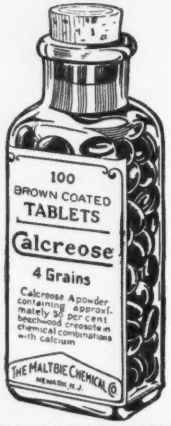

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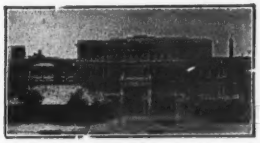

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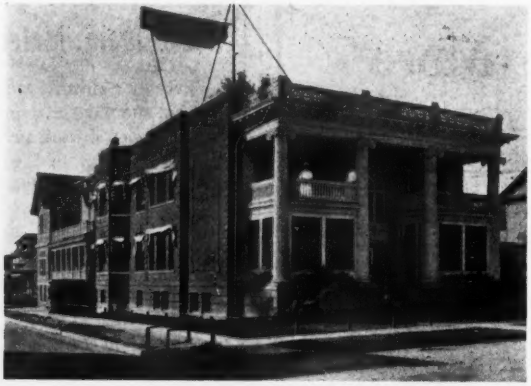

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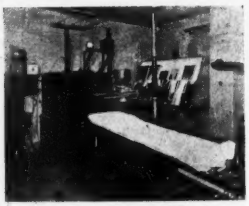

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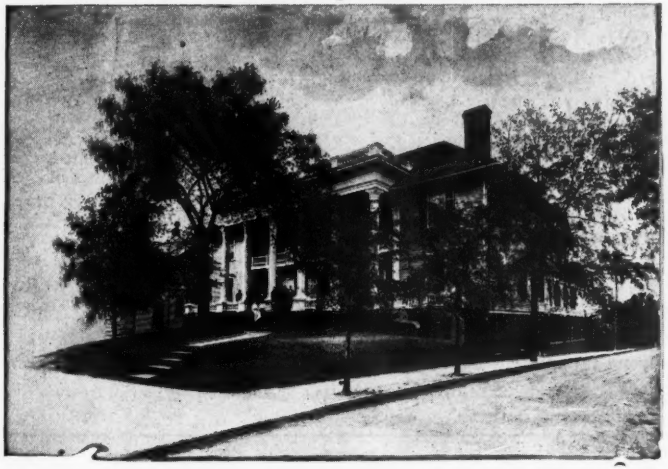

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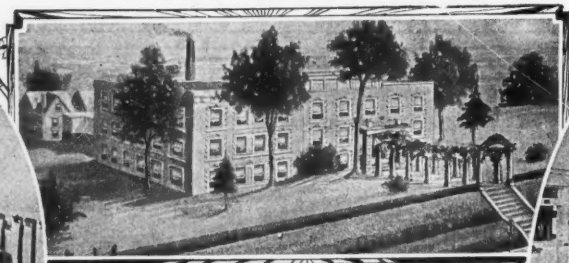

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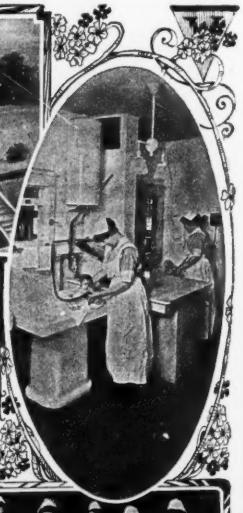

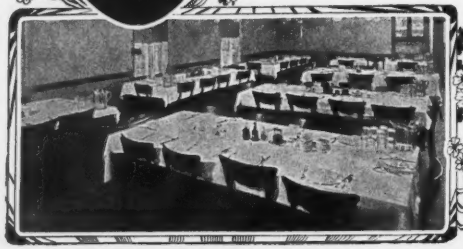

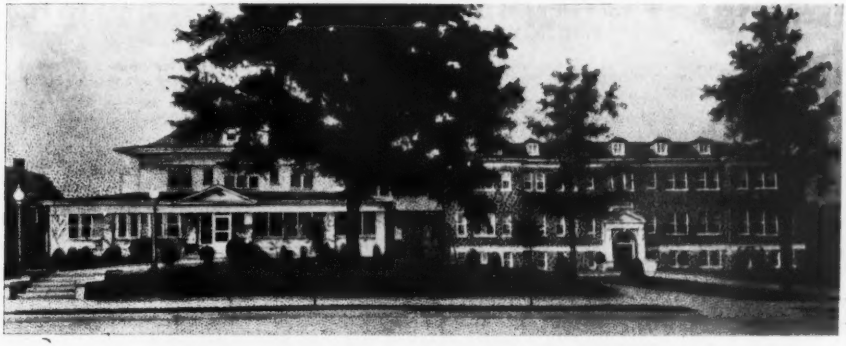

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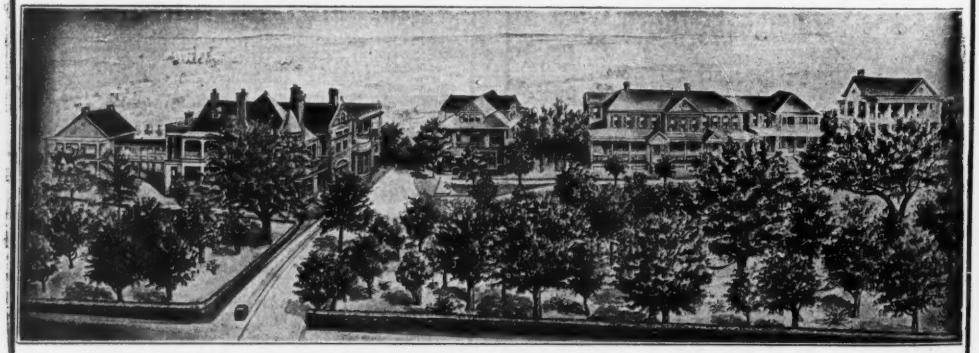

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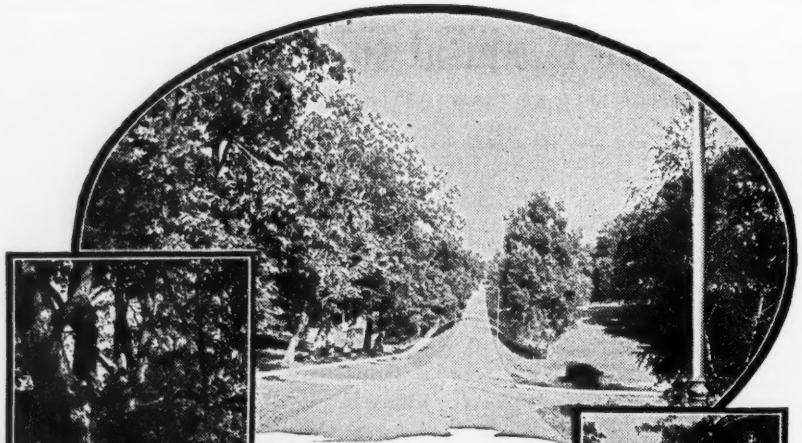

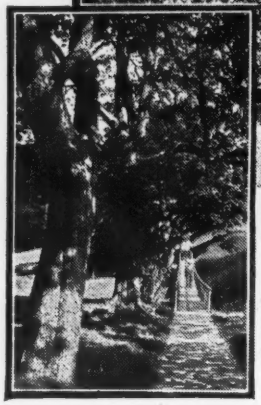

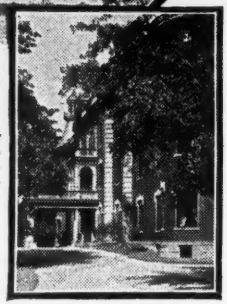

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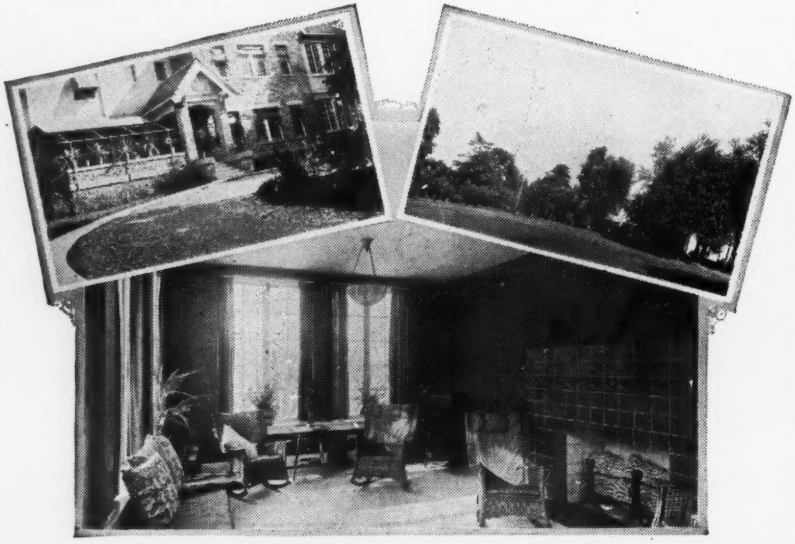

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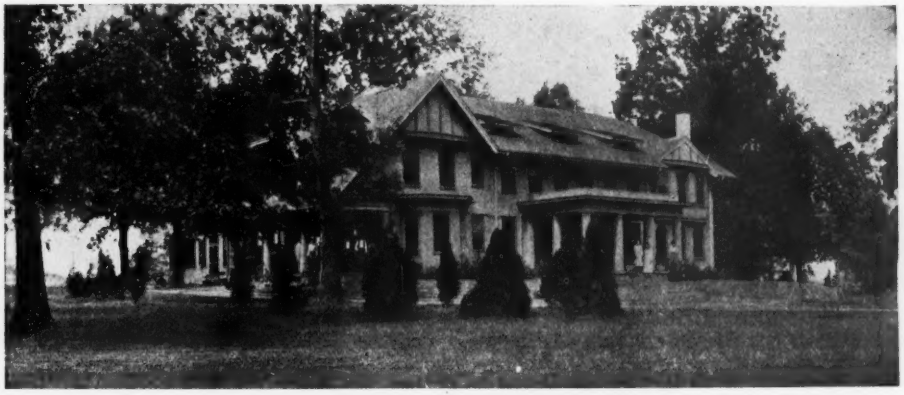

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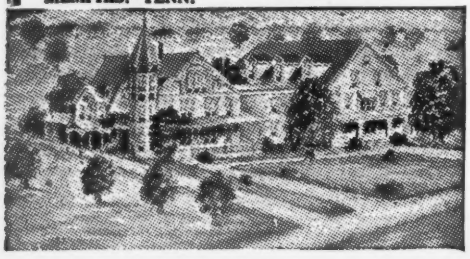

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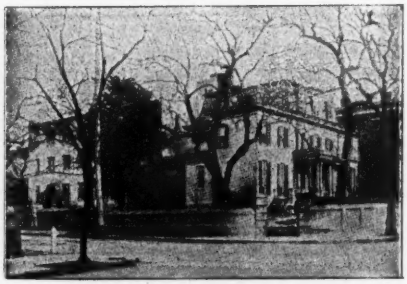

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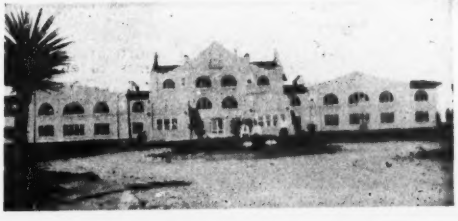

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JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY AT BIRMINGHAM, ALABAMA

Volume XIV FEBRUARY 1921 Number 2

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

THE IMPORTANCE OF A KNOWLEDGE OF SYPHILIS TO THE INTERNIST*

BY ERNEST B. BRADLEY, M.D.,
Lexington, Ky.

At the time the subject for this paper was requested I had been so impressed with the number of cases of visceral syphilis encountered during a relatively short period that I inadvertently chose this title. On studying the literature, I find that Dr. Lewellys F. Barker, in two previous papers along the same line, has so completely covered this subject that I can add or subtract practically nothing from what he has said. I have been impressed while trying to prepare this commonplace communication that Osler was right when he said: "Know syphilis in all its manifestations and relations and all other things clinical will be added unto you." The vastness of the literature on the subject of visceral syphilis alone amazed me, and before I even began to put together any ideas on the subject I saw that if I had undertaken to write a treatise on medicine itself, I could not have selected a much more comprehensive title.

Syphilis is a common disease. Its prevalence in every community and in every walk of life is just beginning to be realized. Just what proportion of the entire population is affected is not definitely known, but Wassermann reactions have been done upon thousands of cases admitted to hospitals and these reports are now available. Thus, out of 10,000 cases admitted to a Philadelphia hospital during 1916 and 1917 Rosenberger reports that 27 per cent were positive in 1916 and 26 per cent in 1917. Of about 3,000 cases admitted to a St. Louis hospital the positive serum reactions varied from 6.3 per cent in the private well-to-do class to 30 per cent among the negro ward cases. Again, at a United States Army base hospital at Fort Riley, 13.8 per cent of white and 24.1 per cent of negro soldiers admitted for all causes gave a positive Wassermann. Large groups of private patients who came for diagnosis have been reported, with averages of from 15 to 20 per cent positive. It is interesting in this connection to know that 15 per cent of these cases giving a positive blood test showed no signs of the disease. In autopsy material, the incidence of syphilis is even greater. Observers report it in from one-third to two-thirds of all adults.

There can not be a more fascinating study than syphilis. There is a reason for this. When the diagnosis of syphilis is established in late lesions, we know that treatment offers much more hope than in conditions simulating it. We may not be able in the vast majority of cases to effect a cure, but the patient is delighted when the symptoms disappear, as they so often do under proper treatment. It is necessary to distinguish in so many cases between syphilis and malignancy that we frequently find ourselves hoping for a positive Wassermann report on cases for

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diagnosis. As an example, a patient is seen with a growth on the tibia and the question of sarcoma arises. Perhaps it is a nodule in the tonsil, or an ulcer on the tongue or soft palate suggesting carcinoma, or it may be a growth in the testis or enlargement of the liver, or tumor of the brain or mediastinum simulating malignancy. In conditions of this kind I know nothing more satisfactory than to get a positive Wassermann report and see these lesions clear up under treatment. There are other symptoms and conditions in which a diagnosis of syphilis when established gives us an equal amount of satisfaction. Among these may be mentioned: violent chronic headaches, aphasias, convulsive seizures, or attacks of unconsciousness, paralysis of various muscles, obscure joint conditions and attacks of angina pectoris.

During the past ten or fifteen years no other disease has received the same amount of attention as has syphilis. Since the discovery in 1905 of the spirochetapallida as the causal organism, followed closely by the announcement of the Wassermann reaction the next year, and in 1910 the introduction of arsphenamine, our knowledge of the disease, its diagnosis and treatment has made progress which is really marvelous. Is it too much to hope that in the not far distant future with still better methods of treatment, late manifestations in the nervous system and viscera may be an uncommon occurrence?

An early diagnosis of the specific nature of the initial lesion is not a difficult matter by dark-field examination. And it is little less than criminal on the part of the physician to await the advent of secondaries or even a positive Wassermann reaction. It is in this early stage, before the Wassermann becomes positive, that there is the greatest chance for a cure. Unfortunately, only a small percentage of the profession are taking the pains to have dark-field examinations made, though the apparatus and skill necessary for this should be in the equipment of any one treating this disease. However, it is not in the province of this paper to discuss diagnosis of primary lesions, for it is with the later manifestations that the internist is most often confronted.

There is no malady which in any way approximates syphilis in the variety of lesions and symptoms which it produces. So widespread and occult are its reactions that physicians doing purely diagnostic work must insist upon a routine Wassermann examination in all cases coming under their observation. It is necessary in every obscure case to bear syphilis in mind. When confronted with a new case we should ask ourselves the question, "Has this patient been infected with syphilis?" If so, "Can this condition be explained by syphilis?"

Every medical condition in a patient having a positive Wassermann is not necessarily due to syphilis. Syphilitics may have any other disease that non-syphilitics have, but it is remarkable how often the treatment of the luetic condition causes the disappearance of lesions thought to be due to entirely different causes. Failure to appreciate this fact may be the cause of error. For example, it is not infrequent to see cancer of the tongue occurring in patients with positive Wassermann reactions. In these cases sometimes six to eight weeks are lost in treatment with arsphenamine. However, another case resembling these closely clears up completely in a short time under intensive anti-syphilitic treatment. As an illustration of this I might cite two cases in my own experience:

1. A physician of about sixty years of age consulted me for a growth on the tongue that was apparently a carcinoma. He had been treated for lues many years previously. His Wassermann was negative. In spite of that, at the request of his surgeon, I gave him six doses of neo-arsphenamine. This did not influence the growth, which was removed and proved to be a carcinoma. The mistake in this case was in waiting too long, for a leutic lesion of that kind in the mouth is usually improved after the first dose of arsphenamine.

2. I remember very vividly a nice old lady, a grandmother, who came to see me in regard to an ulceration on her tongue which had all the appearances of a beginning cancer, but her blood gave a four-plus Wassermann, and the lesion healed in two weeks under anti-leutic treatment.

Time will not permit us to discuss in detail all the manifestations of syphilis, but I deem it advisable to enumerate the different systems of the body with the lesions of each most frequently encountered.

THE CIRCULATORY SYSTEM

The most important lesion in point of frequency is an aortitis which often involves the aortic valves producing aortic valvular incompetency and, more rarely, stenosis. It may affect the coronary arteries, at times resulting in a narrowing of the lumen of these vessels. It is the commonest cause of aneurysm of the arch of the aorta. Syphilitic degeneration of the heart muscle is a frequent finding in these cases. So common is the involvement of the aorta in syphilitic processes that it outranks rheumatism as a cause of valvular disease. Warthin, from post-mortem examination of 200 cases of syphilis, of which fifty were congenital, concludes that syphilis is the most important cause of both endocarditis and myocarditis. He found spirochetes more often in the heart and aorta than elsewhere in the body, and confirms the fact that syphilis is essentially a vascular disease. Untreated and poorly treated cases of syphilis develop aortitis to a degree variously estimated from 30 per cent to 80 per cent, and a large percentage of these cases will later develop aneurysm. Although the spirochetae early invade the walls of arteries and the heart muscle, usually ten to fifteen years elapse before signs of aortitis appear. Among the prominent symptoms are:

1. Substernal pain or perhaps only a feeling of dull depression in the precordial region.
2. Slight dyspnea.
3. Attacks of angina which is increased on exertion.
4. The mediastinum may become involved from these changes in the aortic wall and in addition to substernal pain may give rise to pain on swallowing.

Any of these symptoms call for a Wassermann test and an examination of the chest by x-ray. That aortic aneurysm was closely related to syphilis had long been suspected, but since 1908 by a more extended use of the Wassermann reaction it has been shown that 75 per cent of all aneurysms are luetic in origin. When investigated these will be found to have been preceded for the most part by symptoms of aortitis. Sclerosis of the coronary arteries gives rise to attacks of angina pectoris which in patients under 50 years of age is most often syphilitic in origin. Aneurysms of other large arteries are less common than of the aorta, but lues must be excluded in every case of non-traumatic aneurysm. I shall cite only two cases coming under this head:

1. A married woman of forty-two complained of typical anginal attacks with pain running into her left arm and the fear of impending death. Blood pressure normal. Heart not enlarged, no murmurs. Her husband had consulted me previously for syphilis. Her Wassermann was four plus. Treated. She was soon completely relieved.

2. A white farmer, aged sixty-eight, for five months had noticed a pain or soreness across the upper abdomen and under the ribs. This pain at times was transferred to the back under shoulder blades. It was worse at night. Examination showed cardiac hypertrophy and dullness in the second intercostal space, slightly increased to left. No murmurs. X-ray showed an aneurysm of arch of aorta. Wassermann four plus.

THE RESPIRATORY SYSTEM

Syphilis of the lungs has always been considered of rare occurrence. With the application of new pathologic criteria which have been evolved since the discovery of the spirochete, characteristic syphilitic lesions have been found in a much larger percentage of autopsies than formerly. Warthin finds evidence of syphilitic infection in the lung in 40 per cent of 750 autopsies. Syphilis may occur also in the pleura and the pulmonary artery. Spirochetes have been demonstrated in these lesions many times. The physical signs are not distinctive and usually simulate tuberculosis which it often accompanies. Gummata may occur in the wall of the tubercle and may cause an old focus to light up into activity. The diagnosis must rest upon x-ray findings, the Wassermann reaction, and finally the therapeutic test. An interesting case in this connection is the following:

The patient, a business man of thirty-five, consulted me in March, 1918, for a paroxysmal cough which had persisted for two or three weeks. His family history was negative. His personal history was unimportant except that for a year previously at intervals he had been treated for neuritis of his left arm. The pains in this arm at times had been severe, but never enough to require morphine. His habits were good. He denied venereal infection. His present trouble began about three weeks ago when he caught cold and began to cough. This had grown worse and he said that it kept him awake at night. He thought he had had no fever, and no night sweats

nor hemoptysis, though he coughed up some yellowish sputum. His physical examination was negative with the exception of a few indeterminate rales at the left apex below the clavicle. X-ray plates of his chest were negative for both lungs and heart and aorta. His blood pressure was 120/75; temperature 98°; pulse 78. Urine and sputum were both negative. Three days later he had several violent paroxysms of coughing and coughed up a pint or more of blood. Hemoptysis continued for three weeks. His blood, when examined, showed a four plus Wassermann. Under arsphenamine and mercury his cough improved within a few weeks and he has had no return of this trouble since.

Other lesions of the respiratory tract occurring in the nose, pharynx and larynx while of interest to the internist come more within the field of the nose and throat specialist.

THE ALIMENTARY SYSTEM

Aside from primary and secondary lesions of mouth and pharynx, and rectum, the late lesions in the alimentary tract are rare if we except the reactions in the liver. That involvement of the stomach is less rare than has been heretofore supposed is a growing conviction. The manifestations in the abdominal viscera most frequently encountered are gummata in the liver. Very frequently this condition, resulting as it does in a nodular enlargement of the liver, with pain, ascites, vomiting, etc., is mistaken for cancer. Regardless of the Wassermann test every such case should have vigorous anti-syphilitic treatment. Often one is surprised to see a case so diagnosed get well. Sometimes the condition resembles Banti's disease closely, or gall-stone colic is suggested, and Wile has reported others that simulate acute yellow atrophy. Fever is often present in syphilis of the liver, but is not characteristic. Enlargement of the spleen is a common accompaniment, and in congenital syphilis is most frequent.

In 1908 there was admitted to the ward at St. Joseph's Hospital a girl of sixteen years of age—sexually undeveloped with no enlargement of the breasts and absence of pubic hair. She had never menstruated. Her hemoglobin was 30 per cent, red blood cells 1,700,000. A very large spleen extended four fingers below the margin of the ribs. A diagnosis of splenic anemia was made and splenectomy performed. After apparently doing well for ten days she suddenly died. Autopsy showed the liver filled with gummata and microscopic sections of the spleen showed tertiary lesions.

In other parts of the digestive tract the stomach offers a field for study, and when the x-ray reveals an atypical ulcer or growth, lues must always be in mind. Differential diagnosis from cancer is often most difficult and both may be present. As with the stomach, clinical interest in other parts of the alimentary tract centers chiefly in the tertiary lesions and those in the rectum consisting of gummata, ulceration and stricture are the most important. A not unusual case is the following:

A negro man aged forty-eight suffered for nineteen years with epigastric pain. This was severe enough at times to require morphin. He vomited considerable blood in several attacks. Was confined to bed for a large part of his time. X-ray examination showed almost complete obstruction at pylorus with a large filling defect at this point. His Wassermann was very positive. Immediate gastro-enterostomy was advised on account of his condition. This, followed by neo-arsphenamine and mercury, gave complete relief.

THE OSSEOUS SYSTEM

The clinical similarity between tuberculous joint disease and that due to inherited syphilis was pointed out by Roberts recently. This is shown by the fact that fifty-one cases of syphilitic joint disease in one of his series were diagnosed by twenty-six experienced surgeons as tuberculosis and treated on that assumption for periods varying from a few months to fifteen years . He states that in the majority of cases evidence of parental infection, or stigmata, or positive Wassermann reactions were found and all improved under mercury and potassium iodide. Roberts claims that it is unwise to make a positive diagnosis of joint tuberculosis until five or six weeks of vigorous anti-syphilitic treatment have been given. Others have shown that many lesions of the vertebrae are luetic when clinically Pott's disease is diagnosed. Illustrating this point is the following case:

A man, aged forty-four, had an enlargement of the knee joint which had been diagnosed by two local surgeons as tuberculosis. Plaster casts were applied. He had also been to a well known orthopedist in a neighboring city, who made the same diagnosis and applied the same treatment. Not satisfied, the patient went to a clinic where a routine Wassermann was done and his blood was found positive. He was referred to me for treatment and in a few weeks the condition was practically cured. This patient had a negative venereal history, but on investigation it was found that his father, long since dead, had had a luetic infection in his youth.

THE GENITO-URINARY SYSTEM

It is only the late lesions of syphilis in the genito-urinary system which are of especial interest to the internist. The most frequent of these manifestations are gummata of the testis, which condition always demands differentiation from malignancy. Syphilitic orchitis, hydrocele, and gummata throughout the urinary tract have been reported. In Warthin's series of autopsies referred to above, he found lesions in the testis more frequently than elsewhere except in the circulatory system. A rather interesting case is the following:

A young man, aged thirty, consulted me because he had two boils on his arm and wished to have a vaccine made. Just under the skin at the elbow were two small swellings about the size of filberts, one of which was discharging and the other apparently softened and ready to open. A small incision was made and a culture of the pus taken for a vaccine. The next day and even forty-eight hours later there was no growth on the culture media. When he returned, one of our surgeons was asked to see the arm, and he thought that I had opened a softened sebaceous cyst. On obtaining a history from the patient I found that he had had two years before what his doctor called a boil on his forehead. This had taken weeks to heal and the scar still remained. Examination revealed a large tumor in the scrotum, apparently the left testis, which was the size of an orange. He thought that it resulted from a strain two years before. He stated that he had never had a venereal sore, though he had had one attack of gonorrhea ten years previously. His Wassermann was four plus and under intensive anti-syphilitic treatment his "boils" healed up promptly, the testis shrunk to about one-third of its size, and he gained twenty pounds in weight in three months.

In this connection we may also mention nephritis of purely syphilitic origin. Though rare, there are undoubted cases of this on record. The following is suggestive:

A widow aged thirty-eight complained of increasing weakness, but no loss of weight. She had regular afternoon rise of temperature. Her previous history was negative except that her kidneys were pronounced "weak" after an attack of scarlet fever in childhood. The husband died a year ago with tuberculosis of the kidneys. Venereal history was negative. Careful examination of the chest and radiograms of chest were negative. Radiograms of the urogenital tract as well as a physical examination showed a low movable right kidney. Urinalysis of a catheterized specimen showed a trace of albumin, numerous red blood cells, and an occasional hyaline cast. The question of cystoscopic examination arose, but before this was done a Wassermann reaction resulted four plus. The urine returned to normal, and the general condition improved rapidly after several doses of neoarsphenamine.

THE NERVOUS SYSTEM

Involvement of the central nervous system may occur early in the secondary stage of this disease, but symptoms of tertiary lesions are especially important in that they often precede locomotor ataxia or general paralysis. Irregularity of the pupils, ophthalmoplegia, bladder disturbance, change in sexual power, gastric crises, pains in the legs or arms, or "rheumatism", may all be the fore-runners of tabes. Aphasias, transient or permanent, paralysis of muscles or groups of muscles, areas of anesthesia or paresthesia, may in many cases be due to syphilis. Unconsciousness or convulsions of any kind if not satisfactorily explained call for a blood Wassermann and a complete spinal fluid examination. The blood Wassermann in these cases may be negative. Some observers report it as high as 30 per cent negative in tabes alone. The diagnosis of cerebro-spinal lues is greatly aided by the findings in the spinal fluid, namely: a positive Wassermann reaction, number of cells increased, increased globulin and the type of curve with colloidal gold solution. Syphilis of the central nervous system must be thought of and sought for in practically every case presenting symptoms which can be referred to the brain or cord. Gummatous meningitis and syphilitic arteritis of the brain can give rise to such a wide variety of symptoms that time will not allow us even to mention them. It would be easy for any one to multiply examples of interesting cases of cerebro-spinal lues. However, I will cite only one.

A white farmer aged 38 was seized with vomiting which persisted for two hours. For the past twenty months he had been subject to such attacks, lasting from a few hours to ten days. At first they occurred at intervals of two months, but recently had been coming every month. He had been a heavy drinker, but had taken no alcoholic liquor lately. He had lost 30 or 40 pounds in weight in the past two years. He had had no lightning pains, no difficulty in walking at night, no "girdle sensation" or loss of sexual power, but for the past month had had double vision. He denied syphilis and said that his blood and spinal fluid had been examined several times and Wassermann reactions were always negative.

He was a very strong muscular man of about 160 to 170 pounds, six feet one or two inches tall. One eye was kept closed on account of his diplopia. The pupils were equal and reacted to light slowly. The knee jerks were normal. He was vomiting

every few minutes. He refused to have a nurse or go to a hospital. Morphin was given that day and again on the day following. The second day afterwards he was still vomiting and he was given another hypodermic, this time of heroin. Within thirty minutes he became unconscious and had generalized tonic convulsions, both arms and legs being involved. He was in extreme opisthotonos. His color was good, but laryngeal stridor very marked. Under morphine he became quiet after two hours and in about ten hours became more conscious. By the next day he was able to talk.

Urinalysis: 1022, heavy trace of albumin, no sugar, many hyaline casts. Blood pressure, systolic only 98, diastolic 80. Blood Wassermann was two plus with one antigen and negative with another.

Spinal fluid examination: Wassermann four plus, cells 166, globulin increased, colloidal gold curve suggestive of cerebro-spinal syphilis (3,221,-100,000). He improved under treatment for three or four weeks when he had a mild vomiting spell and returned to his home in another state.

In conclusion, I wish to say that I realize how imperfectly I have presented so vital a subject. Necessarily many points have been omitted. Syphilitic fever, which has been stressed by Osler, the elder Janeway, Barker and others, has not even been mentioned, and many other points were only touched upon, but I hope that I have indicated, if even in a very feeble way, the tremendous importance of a knowledge of syphilis to the internist.

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DISCUSSION

Dr. Henry A. Christian, Boston, Mass.—It is always worth while to have this topic brought to our attention. The old dictum is that the man who knows syphilis knows all medicine. If that was applicable, as it apparently was in the days before the Wassermann test, how much more is it true today? The Wassermann test is one of the very important contributions that have been made in the last few years to our methods of diagnosis, and I firmly believe in its efficiency. When we organized the medical service at the Peter Bent Brigham Hospital in 1913, we instituted the custom of making a Wassermann reaction on the blood of every patient admitted to the medical service, and that has paid us fourfold and more since.

At the same time, we should be skeptics about the reaction. By that I mean when a report comes back from the laboratory of a positive reaction, or a negative reaction, that does not fit in with the general appearance of the case and the opinion that you have formed, make your first step one of doubting the laboratory report. There are many sources of error in the Wassermann reaction, some of which begin before the blood arrives at the laboratory. There is no harm to the patient if a few days' delay intervenes and the test is repeated. Over and over again in what seems to be a pretty well organized diagnostic machine we encounter mistakes of this kind. It is not fair to treat any patient who has not obviously syphilis on the basis of a positive reaction until that reaction is repeated and is again positive. Obviously the same thing applies when the reaction is negative. You will save errors in diagnosis and errors in treatment by a reasonable amount of skepticism as to the efficiency of the laboratory in connection with that particular specimen. It is not an unfair criticism of the laboratory to doubt its results. It is a stimulating thing, and it puts it up to them to make good to point out the fact they have made a mistake, if that is the case.

I am particularly pleased to have a chance to emphasize that phase of the subject because I have seen a considerable number of errors made on that basis. At the same time I want to say that does not mean I have not the highest degree of confidence in the reaction, and that I use it repeatedly, and if the reaction turns out to be positive on several occasions, and that result is controlled, in my own opinion of the case, I conclude that I was wrong in believing that the case was not syphilitic, and I go ahead and treat the patient on the basis of that evidence of syphilis. I do not accept a single reaction, be it positive or negative, which is against my clinical judgment of the case until I am shown the reaction is right and I am wrong.

Dr. J. B. McElroy, Memphis, Tenn.—I think it may be stated, as a general rule, that a positive Wassermann reaction means active syphilis where it is done properly, and I want to emphasize what Dr. Christian has said and add to that that the corallary does not follow that the disease for which the patient seeks relief is necessarily due to syphilis because the patient gives a positive Wassermann reaction. That is a question which is particularly to be taken into consideration in the diagnosis of visceral syphilis. On the other hand, there are many cases of visceral syphilis which do not give a positive Wassermann reaction. In these cases many times the luetin test of Noguchi is more sensitive, and even this is sometimes negative. These facts tend to emphasize a fact which I think ought to be particularly emphasized at the present time, namely, that the laboratory findings are only an aid in enabling us to make a diagnosis; that in the giving of a diagnosis we must take into consideration the anamnesis, the physical findings, and the data collected

from every source before we can arrive at a satisfactory diagnosis.

With respect to the question of cardiac syphilis, it has been very aptly and tersely expressed in a hibernicism, "the syphilitic heart is not a heart at all; it is an aorta." Our knowledge of syphilitic aortitis, both clinical and anatomical, was brought forth by the brilliant researches of Hodgson and Welch, and the confirmation of this knowledge in recent years by the Wassermann reaction, as well as by the demonstration of the treponema in the lesions, has led us to forget that sometimes aortitis is the result of other infections rather than syphilis. That has been called to our attention by Allbutt in that mine of information he gives us with respect to vascular diseases in two volumes, including angina pectoris.

Syphilis of the aorta manifests itself clinically in a dilatation of the aorta, in aneurysm of the aorta, in constriction or obstruction of the coronary orifices, and in aortic endocarditis. Contrary to the essayist, though, I have never seen aortic stenosis as the result of a syphilitic infection. The treponema is a great dilator in the aortic region, and with respect to myocarditis, these cases of myocarditis, so called, which occur in late life, after forty years of age, and unassociated with any of these manifestations of syphilitic aortitis, are, according to my observation, frequently erroneously diagnosed as chronic cardiovalvular disease, and are rarely, if ever, due to syphilis. It is true that syphilis in its action on the myocardium may manifest itself clinically with involvement of the bundle of His, in the production of heart block or the Stokes-Adams syndrome.

A change in the heart muscle may give decompensation.

With reference to pulmonary syphilis, considering the manner in which it manifests itself, I think it may be divided into two groups clinically. The first group where there is marked fibrosis of lung associated with bronchiectasis and simulating fibroid phthisis. In the second and less common form, in so-called syphilitic phthisis, I think quite probably, with respect to the diagnosis the conditions upon which we should make a diagnosis of syphilitic phthisis are too strict. It, however, is a very rare disease. I recall in my experience as a country practitioner many years ago a case occurring in a young negro man which gave all the manifestations of pulmonary tuberculosis, in which there were repeated examinations of the sputum with negative findings for tubercle bacilli, and upon physical examination it was found that the middle lobe of the right lung was particularly involved. At that time I had seen a statement made by Aufrecht that that was the seat of predilection for syphilitic manifestations in the lung. Upon the strength of that (this was before the days of the Wassermann and before the days of salvarsan) he was put on mixed treatment and recovered entirely.

Dr. Ellsworth S. Smith, St. Louis, Mo.—This paper is a timely one from the standpoint of the internist. There are two points I would like to accentuate especially as regards the cardiovascular apparatus. One point is the frequency with which the cardiovascular apparatus is involved and the damage that it does to the cardiovascular apparatus. According to Fordyce, 25 per cent of syphilitics succumb to some form of cardiovascular disease in contrast with only 3 or 4 per cent of lues of the nervous system, and only 10 per cent of all other lesions than lues, so that involvement of the cardiovascular apparatus is one of the most important results of syphilitic disease. For instance, Brooks in his autopsy studies states that from 50 to 60 per cent of syphilitics die of circulatory diseases. The point I wish to accentuate is this, that heretofore we have generally recognized syphilis of the cardiovascular apparatus fifteen to twenty years after the initial infection. The recent studies of Brooks are more hopeful. He calls attention to the fact that lues being essentially a vascular disease and being really a septicemia, involvement of the cardiovascular apparatus is one of the earliest manifestations. He cites the case, for instance, where a patient, quite a young man, succumbed to a small perforation of the aorta before the secondary manifestation occurred—in fact, before the diagnosis was made—and yet the autopsy showed a definite syphilitic disease of the myocardium and syphilitic disease of the vaso-vasorum of the aorta.

Since that time he has studied a number of cases and has instituted energetic treatment early, with the result that a certain proportion of these cases have never developed cardiovascular disease, and those who did develop cardiosvascular disease early, in them the symptoms and signs have been controlled. In other words, the purpose of his work is to call attention to the fact that we should watch cardiovascular and renal syphilis as we should watch a case of cardiovascular involvement in rheumatic fever. We should watch the heart just as carefully in a case of syphilis as we should in a case of rheumatic fever in order that the lesions may be detected and treated energetically before an incurable condition results, such as thoracic aneurysm, angina pectoris and the other conditions that may develop.

Another important point, I think, is the recognition of the chronic form of the disease in the way of chronic myocarditis. If we remember the dictum of Cabot that 12 per cent of all failing hearts are luetic, we should be careful in our observations of cases of chronic myocarditis to think always of lues as a possible factor. If that is done, treatment along that line will often give us results where the treatment with cardiac remedies would give us no results.

Dr. M. L. Graves, Galveston, Tex.—In the early days of my studenthood I heard one of my professors say that hysteria was the most protean of all diseases. I rather imagine if he were living today and had had a large experience in the treatment of internal diseases, or in the diagnosis of them, he would now conclude that syphilis is the most protean of all diseases, and it is quite appropriate.

Dr. Bradley has given us an excellent resume of the effects of this infection upon the various organs of the body.

A few years ago I read an excellent article from the pen of Dr. Barker in the *American Journal of Syphilis*, the first issue of that journal, I believe, dealing in a most comprehensive manner

with this disease in its various aspects in connection with the various systems and organs of the body, and from that time it has been my habit to refer the senior class to that article for such information as they might desire or require.

One hesitates to add to the list of diseases mentioned by the doctor in his article and others, and yet I recall at the present time a very marked case of deep jaundice persisting on which a very reputable surgeon had operated for gall-stones, and which subsequently showed a four plus positive Wassermann, and the patient was entirely relieved by antisyphilitic treatment.

I have in mind two cases that simulated very closely a disease which you shall hear about shortly, that of pernicious anemia, in which the superficial aspects of the case and a measurable degree of the blood findings approached the exhibit in pernicious anemia, so that one has to be extremely careful in drawing a diagnostic conclusion.

One other point I should like to touch upon here. The essayist, in recounting these various diseases, such as angina pectoris and others, remarked that a few doses of arsphenamin or neosalvarsan relieved or cured the patient. I just wondered as he was speaking about that if he meant relief of the patient from the syndrome with which he came complaining, and with it whether he has finished the treatment of the case. If so, not one of those patients has been cured. The patient has only been relieved of the immediate distressing symptoms.

This disease, so important to the public, has its analogy in tuberculosis. I believe it was about 1882 we became familiar with the discovery of the tubercle bacillus, and yet I should say the remarks of Dr. Victor Vaughan made at a meeting of the Council on Health and Public Instruction of the American Medical Association last spring in Chicago, which surprised me, are quite measurably true. He stated that twenty years ago he made the prophecy that tuberculosis would be conquered in twenty years. He said nineteen years had already passed and tuberculosis was no nearer solution today than it was when he made that prophecy nineteen years before. He said: "If I were to repeat the prophecy now I would extend the time for conquering it to five hundred years." This appears to me to be drawing the bow a little strong in the light of scientific activities today, but that is measurably true of syphilis, and unless we treat it much more persistently and at a more early period of its occurrence, it will be more than 500 years before it is eradicated from the scourges of the human race.

Dr. F. Walter Carruthers, Little Rock, Ark.—Only two or three points in reference to this subject come to my mind that I would like to lay stress on. One of them was emphasized by the roentgenologist in our hospital and that was the need of examination of the gastrointestinal tract in cases in which there was a suspicion of syphilis in the stomach. Examination of this tract by x-ray has revealed to us that almost immediately upon the introduction of the barium meal into the stomach it empties, and it has been proven that these cases give positive Wassermanns.

In discussing the question of syphilis it is absolutely a crime for the medical profession to make a diagnosis of any disease without eliminating syphilis. It is a well known fact that we are all too prone to jump at a conclusion and make a final diagnosis. We can all recite or recall cases that without a doubt could have been cured if we had gone about making a diagnosis by elimination. There is never a medical meeting held, I venture to say, that some one does not get up and lay stress on the point of making diagnosis by elimination, yet we will go home and in a case like the one Dr. Graves has recited of the eminent surgeon who diagnosed gall-bladder trouble because the man had jaundice, and operated. The follow-up records in such a case would fail to show any improvement in the case and as a last resort a Wassermann was made and found to be positive. The case was then treated to a successful recovery. I want to repeat: we should in all our cases remember the predominance of syphilis. We know that it can clinically show itself to resemble any case known to man. It presents itself in every shape, form and fashion. Then why do we make a diagnosis without eliminating syphilis?

Dr. William deB. MacNider, Chapel Hill, N. C.—I made this summer an observation that was interesting. We assume that aneurysms of the arch and of the thoracic aorta are luetic in origin. We also believe I think that dogs do not have lues. This summer, during some experimental work, I found two beautiful aneurysms, one of the arch and one of the thoracic aorta in dogs. One was a pup and the other was a dog eight and a half years old.

Dr. Tom A. Williams, Washington, D. C.—The question under consideration is one of diagnosis in the main. In the objections made by the various discussors of the paper as to obscure cases which they had not suspected to be syphilis, and which they later found to be syphilis, great reliance seems to have been placed on the Wassermann reaction. Now, we know quite well that in a large number of chronic syphilitics, especially in cases of latent syphilis, and I am speaking in the main of syphilis of the nervous system, we do not find a positive Wassermann reaction; hence if one's suspicion of the syphilitic nature of the case is to be judged only by the Wassermann reaction, we shall miss the diagnosis in a considerable number of cases. We are referring especially to cases in which there are obscure abdominal symptoms which do not show usually the signs of local disease in the abdomen, either by methods of clinical examination or by x-ray observations. We find that a number of these cases are not due to lesions in the abdomen, whether syphilitic or not, but they are due to lesions of the nerve roots, causing pain, producing vomiting in some cases, producing uneasiness and various symptoms of that kind. In such cases, even when the Wassermann reaction is negative, if they are suspected to be possibly syphilitic, we find in many of them very definite objective signs, but these are revealed only on a close and careful study of the reactions of the nervous system; a fine study of the reflexes in a way not usually examined. I do not mean the common, familiar reflexes. Further, a very care-

ful study of the quantitative variations in the sensibility will often in such cases reveal the fact that a nerve lesion is present—a nerve lesion such as we know by experience occurs nearly exclusively in syphilis. Now, that applies not only to the abdomen, but it applies to obscure symptoms all over the body. I have reported a number of such cases as long ago as 1909.

I want to make an appeal for a more careful neurologic study of every case in which the diagnosis is obscure, even when the Wassermann reaction is negative and the symptoms do not seem to point to the nervous system.

Dr. Bradley (*closing*).—I wish to say that I agree with Dr. Christian in regard to the reliance to be placed upon the Wassermann reaction. However, it has been my experience that we can rely on positive Wassermann reactions if these are done under our own supervision. It is advisable for any one doing diagnosis or treatment of syphilis to have a pretty good working knowledge of the Wassermann test. One should know the difficulties of it, the way the Wassermann reactions are to be read, and what a positive reaction looks like. He can then appreciate what a very positive reaction means, or what a faintly positive or negative reaction means.

There is no doubt that there are many cases of late syphilis which shows negative Wassermann reactions in the blood. That point was not more emphasized for want of time.

Most cases of cerebrospinal syphilis that have no symptoms whatever have a negative reaction in the blood, but give a positive reaction in the spinal fluid. Cases have been reported as cerebrospinal lues with negative Wassermann reactions in both blood and spinal fluid, but the diagnosis remains in doubt. There is one final test of syphilis besides the Wassermann reaction. It is the oldest test of all. I refer to the therapeutic test—vigorous antisyphilitic treatment. This is especially true in certain joint conditions, or in congenital syphilis, because a great many of these cases that give negative Wassermanns clear up promptly under antisyphilitic treatment.

The same thing is true of visceral syphilis which gives a negative reaction. Every case of suspicious cancer of the liver should be given antisyphilitic treatment. There is no harm done by so doing, and sometimes these cases get well under that treatment.

Dr. Graves seems to think that I stated that cases of syphilis cleared up in one or two years under neoarsphenamin treatment. I hope the Section did not get that impression. I was not giving the treatment of syphilis. When I stated that a case improved after one or several doses of arsphenamin I did not mean to say that that was all the treatment he received. I mentioned this to further prove that the diagnosis of syphilis in that case was probably correct. Naturally many of the cases cited are still under treatment.

A PHYSIOLOGIC BASIS FOR THE TREATMENT OF CHRONIC CONSTIPATION*

By Horace W. Soper, M.D.,
St. Louis, Mo.

The researches of Rosenheim, Holzknecht, Case, Cannon, Hurst and others in the physiology of defecation have enabled us to place the treatment of chronic constipation on a rational basis. W. H. Mayo has made a careful study of the anatomy of the recto-sigmoid apparatus, and has pointed out the analogy existing between it and the cardia or pylorus.

The recto-sigmoid has the same arrangement of circular muscle fibres and a similar nerve supply. Hurst designates this region as the recto-sigmoid angle and has shown that it performs an important function in regulating the time of the act of defecation. It appears that the recto-sigmoid apparatus holds up the column of feces and prevents it from entering the rectum until the proper time for defecation has arrived. At this time the muscle fibres relax and permit fecal matter to enter the rectum. The weight of the feces excite the "muscle sense reflex," causing expulsion of the rectal contents. This procedure is repeated until, as Hurst has shown, the normal adult doing active muscular work will completely empty the colon from the splenic flexure to the anus.

It must be emphasized that at all other times the rectum is free from fecal matter. Under normal conditions but one such passage should occur daily. After the act of defecation it requires about twenty-four hours' time for the fecal column to reach the recto-pelvic junction. About thirty-three hours' time is required for a meal to be entirely evacuated from the gastro-intestinal tract. Food taken nine hours before the act of defecation should reach the splenic flexure and part of it appear in the feces. These figures (Hurst) represent the time required for the average healthy individual at active muscular work. Modifications must, of course, be made for the asthenic type, who habitually have

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a slower rate of gastro-intestinal motility, as well as the hypersthenic type, whose motility is higher than the average normal, as pointed out by Mills in his work on Habitus.

While the x-ray is the best means by which to determine colonic motility, simpler tests are available, e. g., a five-grain carmine or charcoal capsule given with the evening meal should appear (traces at least) in the feces evacuated the following morning. No trace of the carmine or charcoal should be present on the third morning, i. e., sixty hours after the ingestion of the capsule.

The first group of patients which I wish to consider belong to the class that I have designated simple, uncomplicated constipation. My case records show that this class is by far the largest one of all, representing about 50 per cent of constipation from all causes. After a thorough study of such cases, including x-ray of the gastro-intestinal tract, feces analysis and procto-sigmoidoscopy, we find no evidence of organic trouble. In other words, the mechanism necessary for the production of normal colonic function is intact, but through neglect and abuse it has become ineffective. These cases give a history of constipation lasting all the way from one to twenty-five years. The manner in which the constipation has been produced is in all cases practically the same.

After each period of defecation the patient hurriedly empties the rectum only, the descending and iliac-colon remaining full of fecal matter. The recto-sigmoid apparatus again relaxes, permitting feces to enter the rectum. This produces a call for defecation. This is unheeded until finally the "muscle sense" of the rectum is lost and the patient resorts to the use of purgatives and enemata.

TREATMENT

The patient must be instructed in the rudiments of colonic physiology. Enemata and all purgatives must be stopped at once. The fecal column must be permitted to form in the lower colon. It will require from three to four days for this restoration to occur. During this time patients, who are apprehensive of disaster, must be reassured. Nothing will happen even if the bowels should not act. On the third day the sphincter should be dilated or preferably the procto-sigmoidoscope introduced. The passage of the instrument usually excites enough stimulation to cause a passage. We have employed a form of colonic pressure which is valuable in aiding the patient to secure a complete evacuation. The procedure is as follows:

The patient should lean forward in the defecation posture, with the abdominal muscles relaxed, and make deep, steady pressure directly under the ribs deep in the costal angle on each side of the epigastrium. In all probability the benefit secured by such pressure is caused by a stimulation of the nervous mechanism of the colon.

The patient is instructed to drink a pint of cold water upon arising, followed immediately by fifteen minutes of active muscular exercises directed towards the abdominal muscles. After breakfast he must make an attempt at defecation, allowing at least fifteen minutes' time for the act. The diet must be generous, especially rich in vegetables and fruits. Agar-agar is always helpful, inasmuch as it prevents too much drying of the feces and furthermore facilitates the passage along the colonic wall.

The restoration of colonic function adds much to the well-being and health of such individuals. The time required is from four to six weeks. It is remarkable that the colon will undergo such abuse without developing any pathological lesions or suffering any serious crippling of the neuromuscular mechanism. Many persons not of nervous temperament and not introspective have taken the discomfort produced by daily purgation as a matter of course. This attitude is encouraged by some physicians who, regardless of the teachings of modern physiology, still think of the human colon as a sewer that should be kept flushed out. This is possibly a relic of the old humoralistic theory of pathology.

I have considered above the cases of simple, uncomplicated constipation, i. e., those who have been fortunate enough to escape serious damage. There remains a large percentage who are unquestionably damaged by the daily use of purgatives and

enemata. They may be grouped as follows:

Group I—Sphincter spasm and rectal contractures.

Group II—Spastic contractures of the recto-sigmoid region and spasm of the iliac colon.

Group III—Pus infections of the rectum and recto-sigmoid region.

Group IV—Atony of the rectum and sigmoid.

SPHINCTER SPASM AND RECTAL CONTRACTURES

In cases of this character the sphincter muscle is very tight and resists the introduction of the examining finger or instrumentation. Inspection of the mucous membrane of the anal canal reveals the presence of a mild inflammatory process. No break in the membrane, such as an ulcer or fissure, is present. The entire rectum is contracted and resists the passage of the proptoscope. The rectal mucosa is deep red and congested. Some mucus and fragments of fecal matter are found in the folds. The patient complains of tenesmus and gives a history of several small ineffectual daily passages. Treatment consists of dilatation of the sphincter and rectum by means of graduated protoscopes. The patient must be given the same instructions for the restoration of colonic function as considered above in the treatment of simple, uncomplicated constipation.

SPASTIC CONTRACTURE OF THE RECTO-SIGMOID REGION AND SPASM OF THE ILIAC COLON

These two conditions are often present simultaneously in the same patient. However, they may exist independent of each other.

Spastic contractures of the recto-sigmoid region produce a definite syndrome, which I have designated as "sigmoidospasm." The patient gives a history of ever-increasing difficulty in obtaining a bowel movement. The passage is usually accompanied by pain in the left groin. The feces are fragmentary in character, consisting chiefly of small hard "marbles." Enemata of water are introduced with difficulty and often produce severe colic. Sigmoidoscopy reveals the presence of a very tight contracture at the recto-sigmoid angle. It is imposible to get the smallest size tube through it. It even resists the pressure of the cotton applicator. Sometimes it is possible to pass through the small oiled applicator.

As I have shown elsewhere, solutions of magnesium sulphate applied directly to this area act as a specific in overcoming the hypertonicity of the circular muscle fibres of the recto-sigmoid apparatus. The cotton applicator is moistened with a saturated solution of magnesium sulphate made directly to the spastic area. Treatment is repeated every second or third day until the spasm finally relaxes and function is restored.

Spasm of the iliac colon can be detected by means of palpation. Under normal conditions the iliac colon can be felt as a rather small cord, but it will alternately contract and relax under the palpating fingers. In atony of the iliac colon no contracture can be felt. In chronic spasm of the iliac colon it can be palpated as a rigid unyielding cord usually tender to pressure. Inasmuch as it is impossible to reach the iliac colon by the sigmoidoscope in most cases, resort is made to the following procedure:

The patient is placed in the knee chest posture and the sigmoidoscope introduced as far as possible. A well lubricated soft rubber catheter is passed through the tube and from one to two ounces of a saturated solution of magnesium sulphate injected by means of a piston syringe. The sigmoidoscope and catheter are withdrawn, the patient remaining in the knee chest posture for at least five minutes. These treatments are continued until the spasm relaxes. The patient must, of course, make the same efforts to restore colonic function as described above in the treatment of simple, uncomplicated constipation.

The results of specific treatment in these cases are brilliant and permanent. Temporary relapses may occur in neurotic patients and in those who are obliged to travel and are thus unable to follow their usual mode of life.

In my opinion purgatives and the use of enemata are equally to blame for the production of the spastic contractures in this region of the bowel.

PUS INFECTIONS OF THE RECTO-SIGMOID REGION

The rectum and sigmoid are especially likely to be invaded by the pyogenic micro-organisms, particularly the streptococcus, staphylococcus and several forms of diplococcus. In many cases the origin of the trouble is difficult to ascertain, but I am convinced that the water enema is responsible for many of the infections. It is probably introduced by the enema tube. Cases present themselves with varying degrees of infection, ranging from mild granular proctitis to severe ulceration of the entire mucous membrane. The average case shows small ulcers here and there in the mucosa, which is covered with muco purulent material. Cultures are made directly through the sigmoidoscopic tube by means of sterilized cotton applicators. Patients, as a rule, complain of diarrhea, but investigation of the case will usually show that the daily amount of evacuated feces is quite small, most of the passage being formed of pus and mucus. Curiously enough severe forms of pus infection limited to the rectum and sigmoid often produce a definite stasis higher up in the colon. One of our cases who had a severe form of pus proctosigmoiditis of ten years' duration showed an x-ray stasis in the transverse colon, which persisted for one week. In this case the infectious agent was in all probability introduced by the enema tube which had been in daily use during the course of a typhoid fever.

Treatment of these infections consists in daily insufflations of a powder introduced through the sigmoidoscopic tube by means of a powder blower. The powder most efficacious consists of equal parts of bismuth subcarbonate and calomel. As I have previously pointed out, calomel is not dangerous, non-irritant, and the best antiseptic of all available powders. Furthermore, it clings closely to the mucous membrane "like the frosting on a cake." This method of using powder insufflations was first advised by Rosenburg and has not met with the recognition it deserves. It is far superior to all sorts of washes and liquid solutions. Liquid solutions are dangerous, inasmuch as they may carry infection higher up into the bowel and change a curable proctitis into an incurable chronic colitis. Autogenous vaccine should be used in every case. However, chief reliance must be placed on local treatment.

ATONY OF THE RECTO-SIGMOID

Atonic conditions limited to the rectum and sigmoid have, I believe, been often erroneously attributed to the use of water enemata. In my experience such is not the case. A majority of the enema users show spastic conditions and infectious processes in the mucosa more often than atony. In all probability this assumption was produced by the fact that patients who suffer from atony of this region are forced to resort to the water enema as the only effective means at their disposal. When the rectum alone is involved in the atonic process, Hurst designates it by the term "dyschezia." In my opinion the condition is produced in normal individuals by the habit formed of permitting the rectum to remain full of fecal matter.

Treatment may be successful in mild cases, but in the severer ones little can be done. The most successful method that I have found is to follow the physiological principles above described combined with regular dilatations of the sphincter and digital emptying of the rectum.

There remains a class of cases in which the recto-sigmoid apparatus has lost its power of contracture. In some cases this condition is probably acquired by permitting large masses of fecal matter to remain in the lower bowel for prolonged periods, particularly in cases of ulcer involving the anal canal. In the majority of cases, however, I believe the condition is congenital or has been acquired in early infancy, in much the same way that Hirschsprungs disease is originated. Sigmoidoscopy shows no line of demarcation between the rectum and sigmoid. All tendency to contracture is lost and the resulting constipation is exceedingly obstinate. No treatment is effectual excepting the use of large enemata of water.

In the presentation of these cases I have purposely emphasized the role which defects in the lower colon play in the production of chronic constipation. Many of these patients suffer from the symptom complex which we may justly attribute to

"autointoxication." We may assume that obstructive elements in the lower bowel lead to a slowing up all along the line and cause aberrant bio-chemical changes which are concerned in the production of symptoms usually termed autointoxication. At any rate it is true that after the restoration of colonic function these symptoms disappear in a large majority of cases.

DISCUSSION

Dr. George M. Niles, Atlanta, Ga.—I wish to say at the outset, I am thoroughly in accord with the conclusions brought out in Dr. Soper's well considered and excellent paper. There is one phase of the subject which I feel might be enlarged on, although the field is so extensive that it does not permit a thorough discussion, and that is speaking of constipation as a habit. In many instances it is really the result of a habit, especially in women, dating back to early childhood or infancy, when these little girls from timidity or other causes would hesitate to obey the call of Nature; consequently there is a lack of sensitiveness about the rectum and colon, so that the need of defecation is not made known so clearly and distinctly. Therefore, these sensations become dulled and blunted, and after a while there ensues this constipated habit with all its train of ills which we so well recognize, and which may be brought under that classification he mentioned as autointoxication—just a broad term which does not mean anything in particular and a good deal in general.

The act of defecation is inaugurated to a great extent by our subconscious power. You all know that there is a dual personality existing within each one of us. This subconscious individuality and subconscious power can mark the time, but you can not do it without fixed thought. You may sleep fairly well during the night and still that subconscious power wakes you. Those who have been careful and particular in moving the bowels at certain stated intervals will know that at a certain time every day they heed the still, small voice that calls them. It is a good idea to have a regular time for performing the act of defecation, even though Nature may not call you, and take plenty of time. For instance, it is a good idea, if a man smokes, for him to take a cigar and smoke it, or to take a book or a newspaper and read it, and not be in a hurry to defecate, but wait there, and when sufficient perseverance is indulged in, defecation will take place. I am not telling you anything new. I am simply calling your attention to things you all know. Those who have been the slaves of constipation for years and have suffered indefinite ills of various sorts, malaise and languor, pessimism, and sometimes despondency, can well realize the feeling of emancipation that occurs when that constipation is overcome. The system clears up. Optimism takes the place of pessimism; energy takes the place of languor. The outlook in life is changed entirely. One sufferer once told me that with the curing of constipation he had been removed from the "slough of despond."

A number of years ago there was a light opera known as the "Sultan of Sulu," which I quote from, and it is said that when a man loses the habit of constipation, becomes regular in his habits and clear in mind, "Each flower bears a new perfume, and the skies are a different blue."

Dr. J. Rawson Pennington, Chicago, Ill.—We have listened to an instructive and practical paper and the discussions have been lucid and interesting. I shall confine my remarks to some of the mechanical causes, which seem to have been inadvertently overlooked.

The rectum is developed from the post-allantoic gut, which buds from the hind gut and grows backward with the hind end of the body to meet the proctodeum, which is a depression in the epiblast and later becomes the anus.

The junction between the hind gut and the post-allantoic gut later marks the division between the sigmoid and rectum, and occasionally is congenitally narrow, giving rise to obstructed defecation or constipation. In such cases treatment, to be successful, must be directed to this defect.

The junction between the post-allantoic gut and proctodeum, or later the rectum and anus, is the pectinate line. There is not only occasionally congenital constriction at this point, but there are sinuses in this region that may and do become infected and cause spasm and hypertrophy of the sphincter and levatores ani muscles. These conditions, when present, also mechanically obstruct defecation and lead to constipation, and must be reckoned with in the successful treatment of such cases. The folds in the rectum called rectal valves may be over-developed or fibrosed and as such also act as a mechanical hindrance to defecation and cause constipation. When such conditions are present, division of these obstructions is necessary to cure the obstipation.

Dr. J. G. DuPuis, Lemon City, Fla.—I have listened to this paper and to the discussion on constipation with great interest. It seems that in considering this subject we should go back to the natural course of events. When a child is nearly to twelve months of age and is nursing at the breast, it has two to six bowel movements a day, yet that child grows and thrives.

The point I want to emphasize is the necessity of keeping to Nature's law as nearly as possible to the manner in which we were created, and that bowel function will be maintained unless there is mechanical obstruction to a greater degree than ordinary. Therefore, our efforts should be directed toward relieving this obstruction. The time reminder is to begin with the early school life of children. Very few parents are advised to go to the public schools to which we have access in the South and all over the United States and see how the detail things are conducted. The average physician does not suggest to the parents that they should take their children to the school and introduce them to the teacher, and tell the teacher about the habits and peculiarities of their children. Whether the child is a boy or a girl, it is very important for that child to keep to the habits that Nature has given it, and I hope when we go home from this

meeting we will advise our friends and parents not to send their children to school alone the first time, but to go to school with the child, and either the first morning or subsequently have a talk with the teacher and emphasize the peculiarities of the habits of the child, especially as they relate to bowel movements, etc. If this is done, much good may be accomplished and habit-forming constipation avoided.

Dr. J. C. Johnson, Atlanta, Ga.—I think it is just as natural for a man's bowels to move as it is for the saliva to flow. It is just as much a physiologic process, and I do not think there is any rule, physiologic or otherwise, as to how much the bowels should move at one time or another or as to how many times they should move a day.

I agree with the principles expressed in Dr. Soper's paper. I also agree with what Dr. Niles said as to the habit of constipation. I believe there is nothing which is more neglected than the so-called constipated habit. I believe there is nothing so misunderstood as the cause of constipation. Constipation is not only a cause; it is a condition, and it is the result of many other troubles. I believe that the majority of cases of constipation, barring neglect and all the relative terms, is due to a fatigue neurosis, whether from mechanical obstruction or otherwise. It can be due to muscular fatigue of the stomach or of the intestinal canal.

In studying the physiology, the pathology and therapeutics of constipation, we must of necessity keep in mind the factors which regulate normal peristalsis in the evacuation of the bowels. What do we have? We have the character of food and the amount. We have the character of the secretion and the amount. We have the propulsive power of the muscle, a kind of nerve force, and a muscular responsiveness to it. We have the secretion of bile, which is too often neglected. There is not a single one of these factors we can depend upon alone to regulate peristalsis in the daily evacuation of the bowels. He who looks at one thing will see it most clearly, but in looking at that one thing, he often overlooks others, and I do not believe that in the consideration of constipation, whether the result of habit or of a mechanical condition, or suppression of secretion, we will understand the pathology underlying it unless we contemplate every factor from the mouth to the anus.

Dr. Robert B. James, Danville, Va.—I am a member of the school board of my city and I find on the monthly report required on each child the number of times the child was excused from the room carefully noted. These excuses are counted against the child's standing, consequently the ambitious or timid child will not ask to be excused and so puts off the time to answer the call of Nature to relieve the bowels, and thus early in life begins a most vicious habit. For we all realize that constipation in many cases has its beginning in this habit of failing to respond to the call of Nature in this matter.

What is customary in my town is probably the custom in other towns, and this matter should be taken up with the school authorities. The report is all right, but this should not count against the child. The report should only call attention to a condition that may require investigation.

Dr. Soper (closing).—I endeavored in my paper to formulate a physiologic basis for the treatment of chronic constipation, furthermore to suggest a classification of chronic constipation based upon pathological conditions. I mentioned in my paper that individuals would differ as to the number of daily defecations. Dr. A. F. Hurst has shown that the normal individual engaged in muscular work, such as young soldiers whom he studied, would have one complete evacuation of the bowels daily, the colon being emptied from the splenic flexure to the anus. It is not the number of bowel evacuations that we are so much concerned with as completeness of the act of defecation. A very good plan is to make a sigmoidoscopic examination of the lower bowel some hours after defecation; under normal conditions we will find the rectum and lower sigmoid to contain no fecal matter. The hyperesthenic type of individual—large, active, robust persons who require more energy—will normally defecate more frequently than individuals of the asthetic type. The energy required of the young infant makes frequent feedings and frequent bowel movements imperative.

A STUDY OF THE REACTIONS FOLLOWING THE TRANSFUSION OF BLOOD*†

By Paul W. Clough, M.D.,
and
Mildred C. Clough, M.D.,
Baltimore, Md.

The clinical experience of the past ten years has pretty well established the therapeutic value of blood transfusion in many conditions and also its limitations. Simplified methods have been worked out which make the procedure practicable in the hands of any physician reasonably well trained in laboratory methods. The reactions following transfusion continue to be the chief difficulty, and the problem most urgently requiring solution.

For purposes of the present discussion these reactions may be divided into three general groups:

1. Reactions following the use of compatible blood.

2. So-called hemolytic reactions, following the use of incompatible blood, where

*From the Medical Clinic of the Johns Hopkins Hospital.

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the cells of the donor are agglutinated or hemolyzed by the serum of the recipient.

3. Severe reactions occurring in patients who have previously received many transfusions, following the injection of blood from a donor belonging to the same blood group as the recipient, and therefore compatible in the ordinary sense. These are comparatively rare, and very few accurate observations are on record which might explain their mechanism.

The first type of reaction with compatible blood has frequently been described. In the milder reactions there is a rise in temperature of 1 or 2 degrees and slight headache and malaise. The severer ones are usually ushered in by a chill, which begins as a rule about an hour after the beginning of the transfusion. It may be of extreme violence, as described by Garbat.[1] With it the temperature rises rapidly from 2 to 6 degrees, reaching a maximum usually within 2 to 4 hours, and falling to normal almost as rapidly as it rose. Exceptionally, fever may persist for two or three days. There is usually headache, prostration and great discomfort, acceleration of the pulse and respiration rate, and in severe cases, nausea and vomiting. Recovery is, as a rule, prompt and complete. Gains in hemoglobin on the average are as great and as well held as in cases in which no reaction occurs. This is true in cases of pernicious anemia, as well as after simple hemorrhage. Our experience in this respect coincides with that of Garbat,[1] of Pemberton,[2] and others.

The frequency of reactions after citrate transfusions is variously reported, from 17 per cent by Mason, Sydenstricker and Rivers,[3] to 60 per cent by Drinker and Brittingham.[4] Lewisohn[5] recently reported 20 per cent of reactions in 200 cases and Pemberton[2] 21 per cent in over 1,000 cases from the Mayo Clinic. In 214 citrate transfusions reviewed by the writers distinct reactions occurred in 32 per cent of the cases, while in 150 syringe canula transfusions reported by McClure and Dunn[6] from this clinic, there were 13 per cent of severe reactions and 17 per cent of mild reactions. Advocates of the syringe-canula method of transfusion[7] claim a lower percentage of reactions than with citrated blood, and the weight of evidence at present seems to support their claim.

Several causes have been suggested for these reactions.

1. Gross avoidable errors in technique. Some reactions may be avoided by using freshly prepared solutions made with freshly distilled water and chemically pure salt and citrate; by using aged rubber tubing which has been carefully cleaned; by injecting the blood as quickly as possible after it is drawn; and by keeping it and injecting it at body temperature.

2. Injury to the cells by the citrate. Some evidence for this has been obtained by Drinker and Brittingham.[4] There is, however, no evidence of blood destruction in vivo.

3. Liberation of toxic substances, probably from the platelets, in the incipient stages of blood coagulation. Evidence for this has also been advanced by Drinker and Brittingham.[4] To minimize this tendency one should use a fairly large needle, at least No. 15; insert it smoothly into the vein of the donor; use as short a rubber tube as possible between the needle and the flask; maintain by gentle suction a free continuous flow of blood; if the flow is interrupted, stop and secure a new needle and tubing; and avoid sucking clots into the flask when the needle is removed from the vein.

4. Incompatibility of platelets or leucocytes. For this there is no evidence. In one of our patients belonging to Group 4, the injection of the buffy coat from 200 c. c. of Group 2 blood was followed by a chill only, while a similar injection from Group 3 blood did not cause any reaction.

The cause or causes of these reactions have not yet been definitely determined.

The hemolytic reactions are entirely distinct from these reactions. They are always due to the use of incompatible blood and may be anticipated whenever incompatible blood is injected. By incompatible blood we mean blood the cells of which are agglutinated by the serum of the recipient, or are agglutinable in the serum of an individual belonging to the same group as the recipient. In the strict sense blood is compatible only when donor and recipient belong to the same blood group. However, the experience of Ottenberg and Kaliski,[8]

of Pemberton,[2] and others has shown that the donor and recipient need not belong to the same group, provided the donor's cells are not agglutinated by the recipient's serum. Agglutinative activity of the donor's serum for the recipient's cells is not as a rule significant, since it is diluted greatly by the recipient's plasma and is distributed over an excess of agglutinable cells.

Furthermore, Ashby[9] has shown that cells transfused from a Group 4 donor to a Group 2 or Group 3 recipient remain in the circulation for from two to four weeks in apparently normal condition. Our experience coincides with that of the writers previously quoted, but whenever possible we use a donor of the same group as the recipient.

The symptomatology of these reactions has frequently been described. It is characteristic and quite different from the febrile reactions. The onset of symptoms is usually early; it may be within ten minutes and may come on after 20 c. c. of blood have been injected, and usually before 100 c. c. have been exceeded. The early symptoms are generalized tingling pains over the body; a distressed full feeling in the head; a sense of constriction in the chest, precordial oppression, or dyspnea; and very quickly a severe acute pain in the small of the back. This is a most characteristic symptom. There is usually a marked flushing of the face and the pulse may be greatly slowed for a few minutes. The patient goes into collapse with a rapid pulse of small volume and low tension. The skin is cold and clammy. There may be syncope, and often nausea and vomiting. Later, usually within an hour, there is a violent chill, a paroxysm of fever, nausea and vomiting, and occasionally delirium. Urticaria is frequent. These later symptoms, however, may occur in reactions of the benign type. Hemoglobinuria usually follows and there may be oliguria or anuria. Jaundice often develops after 24 hours, and herpes has been described. As rightly emphasized by Pemberton,[2] the outcome depends largely on the amount of blood injected. If recognized promptly, and if the transfusion is stopped before more than 100 c. c. of blood is injected, the patient usually recovers. If 500 c. c. are injected death may follow.

The frequency of these reactions varies inversely with the care with which preliminary blood tests are made, and they can be absolutely avoided, except possibly with patients who have had a great many transfusions. Although rare, their seriousness merits a discussion of the means to be taken to avoid them. The technique which has been used in this clinic is essentially that described by Moss.[10] While the group of the patient has often been determined to facilitate a search for a donor, hitherto main reliance has been placed on tests in which the serum and cells of the donor are mixed with the cells and serum of the recipient. Unquestionably such tests are desirable in that they serve as a check on the accuracy of determining and recording the group of the individuals concerned. Where reliance has been put solely on such tests, however, and the groups of the donor and recipient have not been determined, errors have been made and serious reactions resulted. A specific instance of the sort was observed and carefully studied by one of us.

The patient, H, who was later found to be in Group 4, was tested with several donors and reported to match perfectly with one of them, L., who was subsequently found to be in Group 3. A transfusion was attempted from this donor, but was interrupted after 75 c. c. had been injected by a typical severe reaction. The blood of the patient, after the transfusion, strongly agglutinated this donor's cells.

Tests were then made with the blood of several other prospective donors and two of them were reported as matching perfectly. Because of the previous experience with L., these tests were repeated twice, were inspected by several members of the laboratory staff, including one of us, and pronounced satisfactory. Transfusions were given from both of these donors, who were later found to be in Group 2, and severe reactions resulted. Following these reactions the blood of all the individuals concerned was carefully studied and the groups determined. The serum of the recipient then actively agglutinated and also hemolyzed the cells of these donors and of other individuals belonging to Group 2. Three subsequent transfusions from Group 4 donors were given without noteworthy reactions.

The errors in this case were not due to careless technic, but to the fact that before the transfusions the agglutinating activity of the patient's serum towards cells of Groups 2 and 3 was so feeble as to escape detection, even after one hour's observation.

These observations, therefore, indicate that a serious reaction may be expected if a patient receives blood which is theoretically incompatible, even though the agglutinating activity of the serum *in vitro* be too feeble to be demonstrable. Such an accident can be prevented if an exact group determination is also made before the transfusion.

If one depended on the behavior of the serum of a patient in determining his group, a similar source of error would be present in a case like this, where the agglutinating activity of the serum was feeble. However, the blood of a member of Group 4, for example, is characterized not merely by the ability of his serum to agglutinate cells of Groups 1, 2 and 3, but also by the inagglutinability of his cells in the serum of Groups 1, 2 and 3. Indeed, the behavior of the cells may be regarded as the fundamental and constant characteristic of the group and the agglutinating activity of the serum as a secondary matter, which is variable in intensity, and may be lacking. As pointed out by Moss,[10] the group of an individual can be determined without reference to his serum by testing the agglutinability of his cells in specimens of Group 2 and Group 3 serum known to be active. Such serum, if sterile and preserved in sealed capillary tubes, will usually retain its agglutinating activity for several months. By using such serum and a drop of cell suspension from the individual to be examined, the group can be most quickly and conveniently determined, and with a minimum liability of error. We, therefore, recommend that preliminary tests be made to determine the blood group of both donor and recipient by means of their cells, as well as cross tests between the serum and cells of the donor and the cells and serum of the recipient. Also that 3 or 4 volumes of serum be mixed with 1 volume of a comparatively dense cell suspension to lessen the degree of dilution of the serum, and that the preparations be observed microscopically after incubation for at least an hour in the thermostat before absence of agglutination is reported.

There are two other sources of error in the observation of the tests which should be referred to. If fresh serum which has hemolytic as well as agglutinating activity *in vitro* is used, clumping may be masked or broken up and the hemolysis be recognizable only in a diminution in the number of cells remaining in the preparation. It is, therefore, important to examine the preparations immediately after they are set up, and to watch carefully for any such evidence of hemolysis. This error is not likely to be made by an experienced worker, but if made is likely to be followed by very serious consequences. It can not occur with old or inactivated serum, since complement is necessary for the hemolysis.

The third source of confusion lies in mistaking rouleaux formation for agglutination. Typical rouleaux are too characteristic to be mistaken, but if the serum has feeble rouleaux forming power, or if rouleaux are breaking up, an irregular clumping of cells may appear which exactly simulates agglutination. In case of doubt, in the selection of a donor, one should err on the safe side and reject any showing a doubtful preparation, but in actual group determinations this confusion must be avoided. This is easily done by using stored serum, since the rouleaux forming power of serum usually disappears after a few days.

In our experience rouleaux formation has absolutely no significance in transfusions. We have injected citrated blood in which the cells were heavily rouleauxed into a patient whose serum showed extraordinary rouleaux forming power *in vitro* without any reaction whatsoever.

We believe that these sources of error explain very many of the hemolytic reactions described as occurring after "satisfactory" preliminary tests. We believe they will also explain most, at least, of the observations of supposed changes in the blood group of an individual after transfusion, as well as cases supposed not to fit into any one of Moss' four groups. We have studied one such case and found that the confusion was due to rouleaux formation closely simulating agglutination.

The reactions occurring in patients who have received many transfusions require separate consideration. All of the cases which have come under our observation have been patients with pernicious anemia or purpura hemorrhagica. The fact has

been noted by a number of writers that many of these patients tend to react with increasing severity when repeated transfusions are given. As these severer reactions began to develop, they at first resembled the more marked reactions of the febrile type. Where transfusions were persisted in, hemolytic reactions sometimes occurred with gravest immediate symptoms, followed by hemoglobinuria and jaundice. This may be illustrated by a brief summary of two cases.

The first case was a woman with pernicious anemia, belonging to Group 2. The first 14 transfusions need not be discussed. The 15th transfusion from a compatible donor, previously used, was followed by a severe febrile reaction, but no hemoglobinuria. The 16th transfusion from another compatible donor, previously used, was followed by a more severe febrile reaction, and the urine gave a positive guaiac test. For the 17th transfusion a new donor was secured. The preliminary tests, carried out with special care, were negative. Immediately after the injection of 700 c. c. of blood, a very severe hemolytic reaction developed, followed by hemoglobinuria and death in two days.

The second case, a woman with pernicious anemia, belonged to Group 4. The 13th transfusion of 500 c. c. was from a donor conclusively proven to belong to Group 4, but there is no record of a direct test of the donor's cells in the recipient's serum. There was an immediate urticarial eruption, an hour later a violent febrile reaction, followed by oliguria and slight hemoglobinuria, and two days later by jaundice and a petechial eruption.

Ten days later several other prospective donors known to be in Group 4 were tested with the blood of this patient. No agglutination was observed, but the cells of all except one of these donors were hemolyzed in the patient's serum. The 14th transfusion of 350 c. c. was followed by a severe febrile reaction without hemoglobinuria.

Nine months later a 15th transfusion was attempted from another Group 4 donor, whose blood was found to match perfectly in preliminary tests. After 175 c. c. had been injected the transfusion was stopped because of dyspnea. One hour later there was a chill, vomiting, delirium, stupor and an elevation of temperature to 104°. Later there developed jaundice and extreme oliguria for 48 hours. The scanty urine was orange colored and gave a positive reaction for blood.

The blood of the patient and of this donor were thoroughly studied after the transfusion. Both were shown again to be in Group 4. In direct tests the patient's serum caused no agglutination, but some definite hemolysis of the donor's cells.

In this case, then, we apparently have direct proof of the development of a hemolytic activity on the part of the serum which was manifested (though feebly) *in vitro*, as well as *in vivo*, and which must be quite distinct from the ordinary isohemolytic activity, in that it was not associated with agglutination and was manifested against cells of individuals belonging to the same blood group as the patient. Failure to detect such hemolytic activity in other cases probably means that this form of hemolytic activity is often so slight as to escape detection *in vitro*, and that these reactions can not always be avoided even by the most painstaking preliminary tests. Further observations as to this point are very much needed.

We have records of three other similar cases not so thoroughly studied.

SUMMARY

The common form of reaction following transfusion is the febrile type. These reactions follow the injection of compatible blood and can not be foreseen by preliminary blood tests. Outspoken reactions occur in 20 to 30 per cent of the cases and milder ones in 20 per cent more. The severer reactions are disagreeable, but very rarely harmful, and they seem not to lessen the benefit the patient may derive from the blood injected. The cause of these reactions is still in dispute. Some can be avoided by painstaking care in technique. The most important factor is probably the change in the platelets associated with incipient coagulative changes in the blood. Injury to the red cells by the citrate is possibly also a factor.

The hemolytic type of reaction follows the injection of incompatible blood, that is, blood from a donor whose cells are agglutinable in the serum of the patient or of other individuals belonging to the same group as the patient. These reactions can always be foreseen by adequate preliminary tests. It usually suffices to test the agglutinability of the donor's cells in the recipient's serum. It occasionally happens, however, that the agglutinating activity of a serum is so feeble as to escape detection in the ordinary tests. In such cases disastrous errors can be avoided only by making an exact determination of the group of both donor and recipient by testing the agglutinability of their cells in specimens of Group 2 and Group 3 serum known to be actively agglutinating. These reactions begin early in the course of

the transfusion, and have a characteristic symptomatology which should be familiar to every one attempting a transfusion, and which will usually enable one to recognize them promptly, and to interrupt the transfusion before a fatal dose of incompatible blood has been given.

Some of the severe reactions occurring in patients with pernicious anemia who have received a large number of transfusions apparently do not fall into either category. They may occur after transfusions from donors belonging to the same blood group as the patient, and may be associated with hemolysis and hemoglobinuria. In one case reported, the serum showed feeble hemolytic activity *in vitro* for cells from individuals of the same blood group. This hemolytic activity must therefore differ entirely from the ordinary isohemolytic activity, which is only exerted on cells of other groups. This observation emphasizes the importance of testing the action of the recipient's serum on the donor's cells, but it seems probable that the methods now in use will not suffice to foresee and avoid all such reactions.

While it is not yet possible to eliminate all reactions following transfusion, nevertheless with adequate preliminary tests and careful technic the danger involved is so slight that it should never deter one from giving a transfusion when one is indicated.

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DISCUSSION

Dr. James S. McLester, Birmingham, Ala.—There is one sentence in Dr. Clough's conclusions to which I would like especially to invite attention. In speaking of the reaction which sometimes follows the use of compatible blood he stated that many of these reactions could be prevented by painstaking technic. I am sorry Dr. Clough did not lay greater stress upon that one sentence.

One is reminded of the early days of salvarsan therapy, when men sometimes spoke of the "usual chill." Painstaking technic in blood transfusions as well as in other intravenous procedures will greatly reduce such untoward results. If you will permit me to say it, there is a difference between bacteriological asepsis and surgical asepsis, and blood transfusion demands the former.

We can not invariably accept a donor of the same group as absolutely dependable. A certain number of reactions can be avoided if in addition to selecting a donor of the patient's own group we test the compatibility of the two individual bloods. Stress should be laid upon the fact that the citrate solution is not stable, for it tends to decompose. If such solutions are always prepared fresh and autoclaved before a transfusion, results will be more satisfactory.

Dr. J. E. Paullin, Atlanta, Ga.—In reference to the reactions which follow repeated transfusion in pernicious anemia, may they not be due to the hypersensitiveness of the protein contents of the donor's serum, or to other factors, and whether probably skin tests might not determine that fact before it is given.

Dr. Clough (closing).—In reply to Dr. Paullin's question, I think it is conceivable that the reactions may be anaphylactic in character. I have made no attempt to demonstrate this by means of skin tests: in the one case reported there did seem to be definite hemolytic activity on the part of the serum of the recipient toward the cells of the donor, although these individuals certainly belonged to the same group.

I agree with Dr. McLester that painstaking attention to details in the technic is of the utmost importance in reducing the number of febrile reactions, and that the preparation of fresh citrate solution under the most careful bacteriological asepsis is indispensable. Lack of time prevented my giving these points the emphasis they deserved. Apparently, however, there are some features not well understood which make it impossible with our present knowledge to avoid all of these febrile reactions. I think it is probable that incipient coagulative changes in the blood may account for some of them.

I quite agree with Dr. McLester as to the necessity not merely of determining the group of the donor and recipient, but also of testing the activity of the recipient's serum toward the donor's cells before each transfusion, and especially where a donor is used the second time. In my own experience I have never seen a case except the one reported where the serum of the recipient definitely hemolyzed the cells of a donor belonging to the same group. We have seen a few preparations, however, where we were in doubt as to the occurrence of hemolysis, and we have made it a rule to reject a prospective donor whenever there was the slightest doubt as to the interpretation of the results of the preliminary tests.

ON THE ADMINISTRATION OF DIGITALIS TO CHILDREN WITH DIPHTHERIA*†

By Hugh McCulloch, M.D.,
St. Louis, Mo.

PURPOSE OF THE PAPER

When children, during the course of an infection with diphtheria, show signs that the heart is affected by the toxin, they show clinical manifestations of cardiac failure due to certain changes in the heart muscle. In a group of patients at the St. Louis Children's Hospital who had diphtheria, with cardiac failure resulting therefrom, we have noticed, and have reported previously[1], that these children show certain very definite changes in their physical signs and in their electrocardiogram. These changes are of such a nature as to make us feel that the administration of digatalis for cardiac therapy is distinctly contraindicated; that the action of digatalis on the heart would tend to intensify the damage that has already been done, would further derange the cardiac mechanism and add work to a heart muscle already overburdened.

We have felt that attention should be drawn to these facts since scant or no mention has been made of the similarity of the effects on the heart of these two different substances, diphtheria toxin and digitalis. We constantly see children with diphtheria resulting in a diseased heart who have been receiving digitalis. We feel that if the newer methods of using digitalis in large or massive doses are applied to these children, serious, even fatal, results will happen. Experimental proof of these conclusions will be published elsewhere.

CONCEPTIONS OF THE EFFECT OF DIPHTHERIA TOXIN ON THE HEART

These conceptions have been based on two phenomena—changes in the vagus center and nerve, producing various paralyses and changes in the heart muscle. Both these phenomena have been demonstrated by anatomical changes in the nerve and in the myocardium, and the clinical manifestation of heart failure has been explained on the basis of these changes. It has been assumed that a structure so intimately related to the control and mechanism of the heart as the vagus must be responsible for the cardiac failure when extensive and severe pathological alterations of function have taken place in that structure. Imperfect as our knowledge is today concerning the relation of the vagus nerve to the control and mechanism of the heart, we at least can say that it is no longer the matter of mystery and conjecture which it has been in the past. This is due in large part to the development of improved graphic methods for studying the mechanism of the heart under clinical conditions both in animals and in man, in health and disease. By the use of these methods Bayliss and Starling[2], Robinson and Draper[3] and many others have shown that this vagus control on the heart is limited both in kind and extent.

Anatomical changes have been described in hearts examined after death from diphtheria. These changes are a parenchymatous degeneration, either localized or general, and are similar in nature to those changes occurring after many other infections. They have been found constantly, but not always, in these hearts. At times the clinical picture has indicated that the heart muscle was involved extensively and severely by the infection, and yet no lesion could be demonstrated after death. It is possible that these anatomical changes are only one feature of the expression of a functional effect of the toxin on the myocardium, and that in the future it will be demonstrated that they may be more physical or chemical in nature. This conception of functional physico-chemical changes in the heart muscle tissue rests, at present, on hypotheses which lack sufficient proof, but are based on suppositions supported by considerable evidence. Future methods may reveal their true mode of action. At present the explanation for heart failure in diphtheria rests often on the changes in the vagus center and nerve, particularly those fibers leading to the heart. And one frequently encounters the expression, "paralysis of the heart from diphtheria."

Considerable confusion has come about as a result of the recognition of these

*From the Department of Pediatrics, Washington University, School of Medicine.

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changes in the vagus nerve and in the myocardium, and from a failure to differentiate between the two. The confusion has been decidedly augmented by the feeling of helplessness in rendering assistance to the heart when such an event as cardiac failure occurs in diphtheria. Keeping in mind the anatomical changes, it may be terrifying to watch one of these children and feel that so little can be done.

Under such circumstances we are only too willing to grasp at straws in our efforts to render aid, even though we are not sure of the assistance we can obtain from them. Such a straw has been digitalis. Since the introduction of digitalis into therapeutic medicine most brilliant and satisfactory results have been obtained in certain types of heart disease. Other types have not responded so well; in fact, there has seemed to be very little improvement after the administration of the drug.

This failure to improve has been attributed too readily to some individual variation in absorption, potency, reaction or other factors. Withering, in his first descriptions of the drug and its uses, called attention to the fact that it was most useful in those types of heart disease with an irregular pulse. Since his time, and especially within the last few years, it has been shown that cases with a perpetually irregular pulse due to auricular fibrillation show most striking improvement after receiving digitalis[4]. Occasionally some clinical improvement can be attributed to the effect of digitalis on hearts beating at very rapid, regular rates as a result of the so-called rheumatic toxin[5]. In the absence of fever and under favorable conditions the rate is slowed, and with the slow rate the action of heart is improved. However, it has not been established that other types of heart cases are improved in any way by the use of digatalis.

There is a tendency to ignore these limitations in the use of the drug and to administer it to all types of heart disease, irrespective of type, cause or condition. One direct result of this indiscriminate use of the drug has been to discredit its true worth in the proper cases. Fortunately the harm has stopped there, for the drug has been given in such harmless amounts that no ill effects have been produced in cases where its use was not indicated. This indiscriminate use of digitalis has been due partly to an overindulgence in therapy, and chiefly to a misunderstanding of digitalis action, and the type of case best suited to its use.

In studying children with heart disease due to diphtheria we have been struck in many instances with the similarity between the ultimate effect of diphtheria toxin on the heart and those well-known effects of digitalis. The clinical history suffices alone to differentiate which condition we are dealing with. The changes in the cardiac mechanism are similar, and often could have been attributed to either substance.

EFFECTS OF DIPHTHERIA ON THE VAGUS NERVE

Diphtheria toxin, when present in sufficient quantities in the blood experimentally in animals, or in man during the course of the disease, produces degeneration in the nerve center in the medulla and in the axis cylinder of the fibers[6]. This results in a paralysis of the structures depending on those fibres for their innervation. Occasionally other elements of inflammation may be present, but the degeneration is the characteristic change found. It is conceivable that in the early period of changes in the center or nerve, before the continuity of this axis cylinder has been interrupted, there may be some stimulation of those fibers.

In other words, we are dealing with a neuritis of a specific cause which has a predilection for certain nerve trunks. Otherwise the anatomical changes are similar to multiple neuritis due to other causes. If such a result of diphtheria toxin on the vagus can be demonstrated, we should be able to recognize these effects on the heart.

Stimulation of the nerve trunk produces a decrease in the heart rate, varying from ten to fifty or more beats per minute. This is a common effect and its occurrence can be observed in the post-febrile period of diphtheria as well as many other infections. Other effects of vagus stimulation less commonly observed are sinus arrhythmia and premature contractions of the heart, whose impulses originate in some ectopic focus, which may be in the auricles or ventricles. These ectopic foci may change from time to time in location, and

may send out stimuli singly, in pairs, regularly or irregularly or in transient periods, which may produce tachycardia, flutter or fibrillation in aurices or ventricles. Heart block occurs after strong vagus stimulation. The location of the area producing the block is in the sino-auricular or the auriculo-ventricular node, or the auriculo-ventricular bundle.

Complete destruction of the vagus nerve fibers releases the heart from the normal vagus control, and one observes an increase in rate.

EFFECTS OF DIPHTHERIA ON THE MYOCARDIUM

The pathological changes which take place in the myocardium are a parenchmatous degeneration of the muscle cells with an excess of fat in the cells. There is some cellular infiltration and at times there is an excess of eosinophils. Later fibrous infiltration may take place.

Irrespective of the anatomical changes found in the myocardium, there occur expressions of damage to the heart which can be recognized before death. There are perhaps three types of cases, one in which there is a general vasomotor failure with rapid onset and progressive course, with or without cardiac failure. The heart shares in this failure, but the signs are found in the general circulation. A second type shows cardiac failure due to an acute myocarditis in which the cardiac mechanism is undisturbed. A third type shows, in addition to the acute myocarditis, a localized effect on the structures controlling the cardiac mechanism. This effect is best determined by the electrocardiograph. It manifests itself by premature ectopic contractions, which arise in either auricles or ventricles. They occur singly, irregularly, or in regularly repeated series of longer or shorter periods. These ectopic foci may remain in control of the heart contraction up to death or for a long time after clinical recovery from the infection. Heart block occurs very commonly in those individuals who show disturbed mechanism. The area causing the block may be located at any point along the path of conduction of the impulse, between the sinus node and the auricles, in the bundle of His or in its branches. We have reported cases[1] in which we thought this area of block migrated from place to place with succeeding heart cycles and that the lesion causing the block could hardly be due to anatomical structural changes, but was more probably of a functional nature without alterations demonstrable by our present methods of examination. That these effects on the heart are due to changes in the heart and not to stimulation of the vagus nerve could be shown in our cases by the administration of atropin in amounts sufficient to paralyze the vagus fibers and release the heart from vagus control. After such a procedure there was no change in the disturbance of cardiac function further than an increase in rate. This proved to us that the vagus nerve was still functionating and that the cardiac disturbance was not due to vagus stimulation.

DIGITALIS EFFECTS ON THE HEART

Experimentally, and under clinical conditions in man, digitalis produces certain characteristic and well known effects on the heart. These effects, too, have long been recognized, but they have been more clearly understood since the introduction of electrocardiographic study. Digitalis exerts its influence on the heart in two ways, by vagus stimulation and directly on the myocardium.

The expression by the heart of the effects of vagus stimulation from digitalis does not differ in any way from vagus stimulation by other methods. I have already called attention above to these effects. Whether the stimulation to the vagus comes from diphtheria toxin or from digitalis, the result on the mechanism of the heart is the same. It is not known that digitalis destroys the vagus nerve and paralyzes its effects. Digitalis exerts an effect on the heart muscle directly. The ability to conduct the impulse through the Purkinje system can be depressed so much that the passage from the auricles to ventricles is delayed, or the passage may be blocked. There is considerable clinical evidence to show that the efficiency of the ventricular muscle is improved by digitalis through increased strength of contraction. Experimental support for this clinical observation has recently been brought out by Cohn and Levy[7]. Further evidence of digitalis action on the heart muscle is shown by alteration in the form, size or direction

of the T-wave of the electrocardiogram. This is a common effect. We have also observed similar changes in the T-waves in hearts poisoned by diphtheria toxin.

Let us suppose, for argument, that a child shows cardiac failure from the action of diphtheria and let us propose to give him sufficient digitalis to exert some influence on the heart as part of his therapy. What effects can we anticipate from the digitalis? Under these conditions the child has a myocarditis which is more or less acute with changes, which may or may not be anatomical, in the function of the muscle cells. He shows certain alterations in the cardiac mechanism, or if not, he is liable to show them at any time. These alterations constitute at least a potential disturbance in the heart. If the digitalis to be given acts in such a way as to stimulate the vagus, the common action, then we have a summation of effects in the heart from the vagus control of the cardiac mechanism on the one hand, and on the other the potential or apparent derangement of mechanism caused by the diphtheria toxin. Such a summation could hardly be beneficial to a heart otherwise laboring under a handicap. If the vagus nerve fibers have already been destroyed by the diphtheria toxin, and they often are, then digitalis cannot exert an influence on the heart through the vagus either by stimulation or by further destruction.

But let us suppose that the effect of the digitalis is on the heart muscle directly and not through the vagus nerve. The effect on the conduction tissue in the heart would be to further depress the conductivity and bring out a potential heart block or to increase the block if one already were present. If the digitalis exerts an influence on the muscle cells outside the Purkinje system it will increase the irritability of these cells which have already become more irritable by the functional or anatomical changes occurring in them as a result of the diphtheria toxin. What these cells most need is rest from irritating stimuli.

It is possible to conceive that if a child has a persistent tachycardia following diphtheria which, except for its origin, is similar to a tachycardia due to rheumatic toxin, one might administer to him sufficient digitalis to produce a slowing of the heart rate without bringing out other digitalis effects. But one cannot predict beforehand just what effects digitalis will have on a heart, and in a given heart the effect least to be desired may be the one obtained. Furthermore, with our present day methods we are unable to measure and determine beforehand the amount of digitalis which will produce the optimum therapeutic effect in a given individual. Each time we give digitalis to a patient it is in the nature of an experiment. In the wards of the Children's Hospital, in a few favorable cases under careful observation, we have administered digitalis to children who have recently had diphtheria to determine the amounts of digitalis in relation to body weight which will produce an effect on the heart. Our observations are not sufficiently matured for a report further than to say that the amount of digitalis is considerably less than that which is required for a child with a normal heart or a heart which is the seat of chronic infection.

In our opinion, as a result of our observations on the cardiac disturbances due to diphtheria, the use of digitalis is distinctly contraindicated. And we are glad of this opportunity to sound a word of warning against its use. Its administration at present is attended with considerable danger to the life of the patient even if all precautions are taken. And when the drug is administered indiscriminately, with no knowledge of its potency or with no opportunity for controlling the dose to be given, this danger becomes a serious menace. We feel that rest must be provided for the heart by methods and measures other than the use of digitalis.

CONCLUSIONS

(1) Diphtheria toxin, either experimentally or clinically, produces anatomical and functional changes in the structures of the heart by direct action. Clinical manifestations of cardiac failure are due to these alterations of function and not to changes in the vagus center or nerve.

(2) The effect of diphtheria toxin on the heart is similar in many ways to the effect on the heart of digitalis, either directly or through the vagus nerve.

(3) The administration of digitalis to patients with diphtheria is contraindicated because there would result a summation of effects in the same heart.

(4) With our limited means of estimating the optimum therapeutic amount of digitalis, or of controlling its effect on the various structures of the heart, this summation constitutes a real danger to the life of the patient.

(5) Measures for providing rest for the heart other than the administration of digitalis should be adopted.

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DISCUSSION

Dr. W. McKim Marriott, St. Louis, Mo.—This study of Dr. McCulloch's of the effect of digitalis on the heart in diphtheria is one of a series which he has been making with the object of determining a rational basis for therapy in cardiac disease. Studies such as this point out very clearly the direct practical value of the laboratory as applied to clinical problems.

On the basis of clinical experience some of us have gained the impression that digitalis is contraindicated in patients suffering from diphtheritic myocarditis. Several years ago I saw on the same day two children each of whom were suffering from diphtheritic involvement of the heart. Each child had been given digitalis, and following this the pulse rate had dropped below 30 in one instance and below 40 in the other. Both children died shortly after. I could not help feeling that the digitalis may have been at fault, and I have made it a practice never to use digitalis in these cases. The evidence that digitalis caused the trouble was entirely clinical, and if it were not for such studies as these of Dr. McCulloch's we would not have a very definite basis for suspicion that digitalis was contraindicated. When we see electrocardiograms such as Dr. McCulloch has obtained, the whole question is taken out of the realm of imagination and put into the realm of fact. The electrocardiogram of a child with diphtheritic myocarditis is practically identical with that of a patient who has received massive doses of digitalis. In other words, the diphtheria toxin acts on the heart muscle in many respects in the same way as does digitalis. To give digitalis to a child whose heart is already profoundly influenced by the diphtheria toxin is just as logical as giving strychnine to a child with convulsions, and this you would not do unless you were a homeopath.

To many men mere mention of the fact that a patient has heart disease is sufficient to immediately suggest the use of digitalis in the same way that syphilis suggests the use of arsphenamin. Dr. McCulloch has shown one of the fallacies of the indiscriminate use of digitalis.

The paper and the discussion so far has been somewhat iconoclastic. We have had taken away one of our supposed mainstays, but this does not mean that there is no treatment which is of value in these patients. In the treatment of a patient with severe diphtheria it is important to remember that the heart is likely to be involved and that this involvement may not show itself until many days after the throat has cleared. Every severe case of diphtheria should, therefore, be treated as being potentially a cardiac. The patient should be kept at rest and this rest should be as nearly absolute as possible if there are any signs of beginning cardiac involvement. The patient must not sit up to eat, but is best fed by means of a stomach or nasal tube. With definite cardiac involvement the best drug to use is morphin in large doses. This insures complete relaxation and the effect on the heart, such as it has, is beneficial. The cardiac condition is often made worse by the added strain placed upon the heart as the result of paralysis of the respiratory muscles. When the diaphragm is paralyzed relief is obtained by the application of a tight abdominal binder and the elevation of the foot of the bed. With the occurrence of intercostal paralysis and dyspnea artificial respiration by mechanical means may be employed and has been life-saving.

Other therapeutic measures which are not so harmful as the use of digitalis are nevertheless useless in the treatment of this condition. Among such drugs may be mentioned alcohol, caffeine and strychnine. Antitoxin, although invaluable and specific at the time of onset of the diphtheria, is useless in the treatment of the late cardiac complications.

Dr. McGuire Newton, Richmond, Va.—It is impossible for me to add anything to what Dr. McCulloch has said. But I do want to express my appreciation of his work, and thank him for presenting the subject in such a clear manner.

Dr. L. T. Royster, Norfolk, Va.—The chairman need not limit my discussion to five minutes. I felt great hesitancy in discussing at all when Dr. McCulloch asked me to do so. When one has seen many autopsies on patients dying from diphtheria before the electrocardiograph was in general use, those of us who were trained years ago in this line will avoid many of the pitfalls that were mentioned by Dr. McCulloch. The absolutely seared and atrophied appearance of the heart—I know no better word to describe it than if it had been par-boiled—with the impairment of transmissibility of the vagus nerve, which has been brought out, would suggest to one immediately that the heart needs rest. Perhaps some of the digitalis medication came about through a misconception of the action of the drug in a supposed prolongation at one time of the diastole, thereby giving it rest. So when we have a combination of altered transmissibility of the vagus nerve plus a heart muscle that is poisoned to the extent of the muscle's being atrophied and perhaps being replaced by other tissue, we are obliged to acknowledge the value of rest as brought out by Dr. McCulloch.

I was fortunately trained under a good clinician in this line many years ago before the experimental side was brought out and that rest has always been insisted upon. A child with a severe diphtheria presenting the possibility of myocardial involvement should be kept quiet to the extent of even strapping down in bed, so that they can not raise themselves up suddenly. Added to that—I am only stressing what has been said—morphin is a highly essential point.

I only want to stress one phase of the treatment, that is in intubation cases, especially where we see these cases late and where the heart has been pumping against the obstruction to respiration for maybe two or three days—so many of us see them straining a heart that has already been altered by the toxin of diphtheria—morphin and rest are the principal factors in the treatment.

I feel I am not capable of discussing the experimental side and, like Dr. Newton, I wish to thank Dr. McCulloch for bringing this out in a very potent way.

Dr. L. R. DeBuys, New Orleans, La.—I heard Dr. McCulloch's paper before the American Medical Association and I have listened to this one today with a great deal of interest. It seems to me that with the information that he has conveyed to us we should be firmly impressed with the necessity of neutralizing these toxins early in the disease by administering very large doses of antitoxins.

Dr. S. A. Visanska, Atlanta, Ga.—I want to say I appreciated the doctor's paper and enjoyed it very much. I must admit that while I have been practicing a good many years in Atlanta, this is the first time I have ever heard of digitalis being used in the treatment of diphtheria. In all my experience and in consultation work in Atlanta, I have never known of any of the doctors using digitalis in any shape or form in the treatment of diphtheria. After hearing the doctor's paper I think it would be wise for those who had used it to take his advice and not use it again.

Dr. H. M. Austin, Laredo, Tex.—I appreciated the paper very much because of my association with a Mexican physician who gives digitalis in practically all cases of cardiac disease. I have seen some very untoward results from the administration of digitalis in cases of diphtheria. We come directly in contact with a great many cases of diphtheria on and near the border.

REPORT OF A CASE OF FORMALIN URTICARIA

By J. De'Voine Guyot, M.D.,
Bucklin, Mo.

While the number of substances capable of causing urticaria is increasing almost daily, it is, nevertheless, interesting to have definite knowledge of those causes. The case here reported is clean cut and definite.

J. N., age 9 years, was brought to my office by his mother with the history that he had suffered from a violent urticaria for three days. She had administered repeated doses of salts with the idea that it was intestinal in type, the boy having had previous attacks due to intestinal stagnation, but there was no diminution of the wheals.

I was informed that the boy was having some trouble with a tooth and was having it treated by a dentist preparatory to having it filled.

I called up the dentist and found that he was using formalin in the cavity. Knowing that urticaria had been caused in one instance by the application of formalin to a pulp cavity, I requested the dentist to remove the application and thoroughly flush out the cavity. The result was that the urticaria disappeared in six hours.

Heidingsfield reported a similar case in the *Journal of Cutaneous Diseases* which, as far as I can ascertain, is the only other case of the kind reported.

It is not uncommon to find urticaria among workers in formalin, especially laboratory workers, but there the amount of formalin exposure is relatively large.

TROPICAL DISEASES AND PUBLIC HEALTH

HEALTH INSURANCE*

By Frederick R. Green, M.D.,
Secretary, Council on Health and Public Instruction, American Medical Association,
Chicago, Ill.

Compulsory state supervised industrial insurance, social or health insurance, as it is variously called, originated in Germany in 1883. Responsibility for it is generally attributed to Bismarck, at that time chancellor of the German Empire. Various forms of state regulation, partial or complete, compulsory or voluntary, have in the last thirty-five years been adopted in many European countries. To discuss the details of this movement in each country is impossible.

In this country, the subject was first taken up by the American Association for Labor Legislation, which had previously been active in securing the passage of workmen's compensation laws in forty-two states. In December, 1912, it organized its social insurance committee, which in 1914 prepared a tentative draft of a health insurance act. This was introduced in Massachusetts, New York, and New Jersey. In 1917, the bill was introduced into twelve state legislatures. None of these fifteen states adopted the bill. Eight of them (California, Massachusetts, New Jersey, Connecticut, Illinois, Ohio, Pennsylvania and Wisconsin) appointed commissions to investigate the subject. In Massachusetts and California two successive commissions were appointed, making in all ten official bodies which have made surveys, collected evidence, held hearings and issued reports on this question. In New York a reconstruction commission, appointed by the Governor, also considered this subject. In Massachusetts, the first commission reported in favor of compulsory health insurance and the second commission reported adversely. In California, both commissions reported in favor of the plan, but on a referendum to amend the state constitution to permit the establishment of compulsory state health insurance, it was defeated by a vote of 358,324 to 133,858. In New Jersey and Ohio the commissions reported favorably. In Connecticut, Wisconsin and Illinois the majority of the commissions reported against it. In Pennsylvania the commission recommended further study and investigation. In New York the Governor's commission reported favorably, but the bill failed to pass. Up to the present time it has been introduced in fifteen states and passed in none.

Let us now ask what is this proposed plan, stated in its simplest terms? The standard bill drafted by the American Association for Labor Legislation provides that all employees earning less than a given amount shall be entitled to medical, surgical, hospital and nursing care, dental treatment, maternity benefits, cash benefits and funeral allowances. These services are to be paid for out of a fund of which the state furnishes one-fifth. Two-fifths are to be contributed by the employee in the form of compulsory payments of a certain percentage of his wages, variously estimated at from 3 to 7½ per cent, and the remaining two-fifths are contributed by the employer in the form of compulsory payments of about the same percentage of his payroll. This fund is to be administered by a local board for each group of 5,000 employees, to be composed of an equal number of representatives of employers and employees, all the local boards to be under a state commission which will determine the conditions of medical treatment, terms of compensation to physicians, etc.

Details vary in different bills, but do not affect the principles involved. The maximum annual income as fixed by the British law was approximately $800 a year. That is, only employed persons whose gross annual income was $800 or less came under the compulsory provisions of the law. This has since been raised to $1,200. In the model bill drafted by the American Asso-

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ciation for Labor Legislation, the maximum amount is $100 a month. In the Donahue-Davenport bill in New York no limit was specified. The proportionate amounts to be contributed by the three parties also vary in different bills. The amount contributed by each employee is fixed by a sliding scale in accordance with which the amount contributed by the employee decreased and that contributed by the employer increased as the weekly earnings decreased in amount. Employees receiving less than $5.00 a week pay nothing, the employer paying 80 per cent and the state 20 per cent. Medical and surgical attendance is provided either by the appointment of certain physicians as whole-time insurance physicians, or by the creation of a panel or list of physicians in each district willing to care for those insured. Proposals for the compensation of physicians differ. The payment to each physician of a fixed salary, division among all the physicians on the panel of the amount appropriated for medical and surgical services for the district and a capitation system by which each physician is paid in accordance with the number of persons treated or the amount of work done during the year, are among the plans proposed.

Such is the plan in its briefest terms. Endless discussion has taken place regarding details, with the result that the fundamental issues have been lost sight of. What are the arguments in favor of it?

The brief on the model bill prepared by the American Association for Labor Legislation makes the following claims: There is a disproportionately large amount of sickness among the employed. This causes immediate loss of time and wages and results eventually in incapacity and poverty. There are, as nearly as can be estimated, 3,000,000 persons in the United States sick at any one time. Each of the 30,000,000 wage earners loses approximately nine days a year through illness. The resultant annual wage loss amounts to half a billion dollars. The wages paid American workingmen are inadequate to enable them to meet the expense of sickness and to bear the losses consequent on sickness and incapacity. It is, therefore, necessary to distribute this burden among three parties, viz., the employee, the employer and the state. The objects of the proposed plan are, therefore, primarily two, viz., to reduce to a minimum the amount of time lost by workmen through sickness, and to divide between the state and the employer 60 per cent of the cost of the illness of employees, leaving 40 per cent for them to carry as their share.

It would be interesting if time permitted to discuss in detail the evidence produced by the advocates of social insurance in support of their proposition. It can only be pointed out here that the arguments in favor of the plan rest on estimates or opinions and not on facts. The evidence is not "overwhelming," neither does it clearly indicate the need for social insurance, as claimed by its advocates. On the contrary, the evidence is fragmentary, incomplete and unconvincing and many of the conclusions drawn are not justified by the facts. There are no figures in existence showing the death rate in the United States from different causes, or among different social and industrial classes, the amount of sickness in the United States for any given period or class, the average income of workmen in the United States or the average amount of time lost by workmen through illness. Statements made by advocates of the plan are, in the main, based on studies of small groups, the conclusions drawn from these groups being applied at proportional rates to the entire population. Such methods are clearly fallacious. There are no reasonably complete or convincing data which would justify the sweeping generalizations made by the advocates of the scheme. The only way in which convincing evidence can be secured is by a survey of the state in which the proposed plan is under discussion, made not to secure evidence to support a preconceived theory, but to obtain facts as to existing conditions as a basis for whatever constructive action may be necessary. Such a survey has not yet been made in any state.

Let us now examine the plan to determine what it is not.

In the first place, it is not insurance. The essential principle of insurance is the distribution of loss from any cause among a large number of persons subject to the

same risk, so that the loss of one will be borne proportionately by all. For example, 100,000 men owning houses, either by mutual agreement or by taking out policies under a corporation, prorate among the entire number any losses that may arise to any one of the number, so that the loss of each one is distributed among the entire group rather than borne by the individual. That is insurance. The proposed plan is not insurance, since it does not distribute the loss among those exposed to the same risk, but brings in two parties in no way sharers of the risk, viz., the employer and the state. If the proposed plan provided for distribution of the entire cost of illness of employees among themselves, either mutually or through a supervising corporation or the state, then it would be insurance. As it is, it is simply a method of taxing all the citizens of the state, either directly or indirectly, in order to maintain the productive efficiency of part of the population. All the cost will ultimately come on the consumer. Neither the employee nor the employer, as such, will bear any part of the expense. What would happen if such a plan were adopted in any state? The workman, finding that a certain amount was deducted from his wages each week, would immediately demand that his wages be increased enough to make good this deficit. This increased wage would be added to the operating expenses of the plant. The employer could hardly be expected to pay his assessment out of his profits. He would add his share to the operating expense account. So that the cost of production and ultimately the cost of the product to the consumer would be increased by the addition of whatever amount the employees and the employers were compelled to pay, and would be paid by the consumer as an indirect tax and as a part of the price of the commodity. The one-fifth contributed by the state could only be paid out of money secured by taxation. The proposed plan, therefore, is not insurance at all, but is simply a plan for providing medical, surgical and hospital care for employed persons in order to increase the industrial output and so benefit a portion of the population at the expense of the entire citizen body through direct and indirect taxation.

In the second place, the proposed plan is not health insurance. The object is not the maintenance of health, but the maintenance of productive efficiency. It is neither a medical nor a public health proposition. It is purely an economic measure, intended to maintain the efficiency of the employee and the productiveness of the industrial plant at the highest possible point. There is no evidence that the proposed plan would have any public health value. The term health insurance, therefore, is a misnomer. Instead, it should be called taxation for the increase of individual production.

In the third place, contrary to popular conception, the proposed plan is not intended for the relief of poverty and unemployment. In England, which has probably the most elaborate system of poor relief laws of any country, the operation of the poor laws has not been altered by the adoption of social insurance. The proposed plan only cares for those who are employed and who are drawing wages. Those unemployed at the time such a law would go into effect and those incapable of supporting themselves, are in no way provided for under such a plan and would be cared for through voluntary philanthropy or by state charitable institutions, as at present.

In the fourth place, it is unsuited to social, economic and political conditions in this country. It is undemocratic in that it substitutes governmental care for personal responsibility and creates a definite class of employees. In European countries classes are fixed and stationary. A man is born into a certain class and remains in it through life. If he is born into a wage earning family, he becomes a wage earner and generally remains one. In this country, we have no such class distinctions. The employee of today is the employer of tomorrow and the member of the leisure class of the day after. He is not only able and willing, but eager to bear his own responsibilities, to assume the burden of his own mistakes and misfortunes and to reap the result of his own enterprise and energy. He does not need nor desire governmental supervision.

When carefully analyzed, the proposed plan is seen to rest on four propositions,

all of which must be proven in order to establish a case. These are:

1. There is a disproportionate amount of sickness among employed persons causing financial loss, incapacity and poverty greater in proportion than that sustained by the average person and requiring special methods of relief. Until this is proven, there is no reason for special laws for employees.

2. The financial burden caused by sickness is heavier than the average employee is able to bear. Until this is proven, there is no reason to assume that he can not carry his own burden.

3. Present methods of promoting public health and controlling diseases are not adequate. Until this is proven, there is no need of devising any new plan.

4. Compulsory state supervised sickness insurance is the best remedy for this condition. Until this is proven, it is possible that some other remedy may be better.

The burden of proving these four propositions lies with the advocates of social insurance. No one of them has yet been proved. Neither is there at present any conclusive evidence or any mass of statistics or data by which any one of them can be proven. It is not known how much illness or incapacity exists, either among employed persons or among any other class of our population. It is not known what is the average wage. It is not known whether the burden of illness is or is not heavier than the average employee can bear without assistance. It is not known whether existing agencies are adequate or not. Statements as to the number of persons sick in the United States at any one time, among wage earners or any other class, or among the population as a whole as to the amount of time or money lost through sickness are estimates, in many cases are mere guesses, based on generalizations from incomplete and inadequate data and not on facts.

Of the four essential propositions on which the proposed plan rests, the first three can not be proven owing to insufficient knowledge. But even if it could be shown that employees as a class are suffering from an undue amount of illness, that the financial cost is greater than they can bear without assistance, and that present methods for remedying this situation are inadequate, it still remains to be proven that the plan proposed is the best remedy. The claim that health insurance is the best remedy for existing social ills is a pure assumption. At least five alternatives must first be considered. These are:

1. An increase in the wages paid to employed persons so that each one will be able to bear his own burdens.

2. The development of state, municipal and local health agencies to a point where preventable disease will be reduced to a minimum and the burden on the individual lightened by reducing the amount of sickness.

3. The development of voluntary thrift and savings habits among employees to a point where through increased thrift and foresight they may be able to provide for their own emergencies.

4. The development of voluntary industrial insurance on the part of employees and employers in industrial corporations and groups.

5. The development on the part of wage earners and employees themselves of voluntary assessments and benefits through trades unions, benefit associations, etc., for their own protection.

All of these are possible alternatives to compulsory insurance involving the development of methods already in operation. Naturally existing remedies must be considered before a new and untried scheme is adopted. Just as the surgeon would consider every alternative before advising a radical operation, so the inadequacy of existing methods must be proven before taking up any new and experimental schemes.

The attitude of the organized medical profession on this question has been officially determined. The American Medical Association at the New Orleans session in April, 1920, adopted by a practically unanimous vote a resolution declaring its opposition to any plan of compulsory, contributory insurance against illness or any other plan of compulsory insurance provided, controlled or regulated by any state or the Federal Government. A number of state associations have adopted similar resolutions. The organized medical profession is, therefore, unqualifiedly opposed to

compulsory state health insurance.

But while this disposes of the specific question of health insurance, a larger problem at once presents itself. The next question is, whether the rendering of such a verdict constitutes the whole duty of physicians. Let us apply the same situation to the more familiar field of private practice. Suppose any one of us were called as a consultant in the case of an individual patient. After careful examination of the patient we find that both the diagnosis and the treatment are wrong. Is our full duty as a consultant performed when we have stated these conclusions to the patient or to his friends? Under such circumstances, should we not immediately be asked to furnish the correct diagnosis in place of the erroneous one and to supply a proper method of treatment as a substitute for the one we have condemned? And should we not all admit that if we refused to do so, there was no alternative remaining but to confess that the case was beyond our ability and knowledge, and to withdraw and give place to a more capable practitioner?

In the case under discussion, the patient is the social body. That it is suffering from certain ills is probably not questioned by any one. The exact nature and extent of these ills, in other words, the diagnosis, is the question at issue. Until an exact diagnosis is made, any proposed method of treatment must necessarily be empirical rather than scientific. We have questioned the views of those who claim to be competent and qualified to diagnose and prescribe for our social ills. We have opposed the treatment which they have prescribed as unscientific and inadequate. Does not this situation constitute a direct and unavoidable challenge to the medical profession either to furnish a correct remedy for such ills as may be demonstrated, or to admit that the case lies outside of our province and to withdraw in favor of a better qualified authority?

I think we all agree that both the making of a diagnosis and the prescribing of the treatment for the diseases of society are at present beyond the ability and knowledge of any one man, either physician or layman. We are at present without the exact knowledge of social conditions necessary for accurate diagnosis of social ills, nor will such a diagnosis be possible until we exert the same energy, ability, industry and perseverance in the study of social ills that the medical men of our own and previous generations have shown in investigating the diseases of the individual. But the assumption of this task is an assertion of our belief that the study and treatment of social ills are just as much functions of the modern physician as are the diagnosis and treatment of the ills of the individual. What has been the history of the profession on this point?

Up to the middle of the last century, medical practice was individual. No one consulted a doctor until afflicted with some specific disorder. The only interest that the physician had in the patient was a personal one. Little was known regarding the cause of the disease, the method of its transmission or the means for its prevention. If a physician were called to see a patient suffering from typhoid fever, he treated that patient until he recovered or died. There was no way of knowing how the patient had acquired the disease or how any other individual could acquire the disease from him. The physician had no responsibility to the community since there was no act of his the performance or omission of which could in any way affect society either favorably or unfavorably. All that he could do was to care for his individual patient and so far as possible in the case of those diseases which experience had shown to be infectious, to prevent others from contracting it. As Sir George Newman, the chief medical officer of the British Ministry of Health, says, up to 1850 the medical profession had no public or social functions or responsibilities except the enforcement of such crude methods of quarantine as had been established.

As a result the instincts, training, methods and traditions of the medical profession for centuries past have been almost entirely individualistic and have centered on the individual treatment of individual patients. The full duty of the physician was performed when he gave the best skill, ability and care that he possessed to the treatment and care of his individual patients.

Today an entirely different situation exists. Modern medicine has a social value

as great if not greater than its individual importance. The development of the natural sciences during the nineteenth century increased our knowledge of diseases and their prevention more rapidly during the last fifty years than in the preceding 1,800 years of the Christian era. The development of preventive medicine since 1870 is too well known to need recounting. Today if a physician is called to see a patient and makes a diagnosis of typhoid fever, while he will naturally do everything possible to promote the comfort and recovery of the patient, yet the determination of the source of the disease and the prevention of the development of other cases from the initial case as a focus, i. e., the social aspects of the problem, are of as great if not greater importance than the treatment of the individual patient. This becomes increasingly true as the disease increases in rarity and severity. Suppose a single case of bubonic plague were discovered tomorrow in New York City. The correctness of the diagnosis in this single case would affect directly or indirectly every man, woman and child of the millions in New York and of the many millions in the eastern half of the Nation. A single case of yellow fever in one of our seaports might easily change the currents of trade and affect millions of dollars of capital and innumerable human beings. Modern scientific medicine is today one of the most vitally important and indispensable factors in modern life and we have as yet only seen the beginning. We can not now appreciate or realize the possible benefits which our present and future knowledge of diseases and their control will have on the well-being and happiness of the human race.

But while for half a century our knowledge, as Tennyson says, has "grown from more to more," our professional habits have remained the same. While the social value of medical services is now equal to, if not greater than the value of medical services to the individual, the medical profession is as individualistic today as it was fifty years ago, and as it has been for the last five hundred years. The time of medical students is devoted to learning specific facts for application to individual cases. In spite of the rapid development of public health administration as a function of municipal, state and national government and the constantly increasing demand for properly trained and qualified men to serve in official positions, our medical graduates are still trained almost exclusively for the treatment of individual patients. Every medical student is given exactly the same training, largely instruction in the examination, diagnosis and treatment of individual patients. Practically nothing is taught him regarding social medicine. If, after graduation, he has an opportunity to take up public health work, he is forced to get his training at the expense of the community after he has been appointed to office. It is only in the last few years that any differentiation has been undertaken between the training necessary for individual practice and that required of a man who desires to devote himself to the service of the community or the state.

What is true of our medical colleges is also true of our medical societies. Papers on public health questions or on social and economic problems are read to a handful of listeners, while the majority of the members flock to some surgical amphitheater to see a surgeon operate on an individual gall-bladder, or to listen to papers on the diagnosis and treatment of individual patients. Questions of public policy and legislation involving the welfare of an entire state arouse little general interest and are left to a small group of public spirited physicians. Our professional standards are based on the same methods of valuation. An individual's standing or success in the profession is estimated largely by the number of patients he has seen, the number of clinical cases he has reported or the number of operations he has performed. So long as the profession was limited entirely to individual services, these were the natural standards. Today these standards are obsolete.

If it be argued that in the development of social medicine, in so far as it has gone, the physician has contributed his full share of services, often at considerable sacrifice to himself, it can only be replied that this is perfectly true, and that as a health officer or a member of a local or state board of health at a ridiculously small and inadequate salary, or as an attending phy-

sician or surgeon to a public institution or free clinic, the great majority of physicians give valuable services worth large sums of money. But it is at the same time equally true that these contributions, magnificently generous as they are, have been contributed by the physician as an individual rather than as a part of professional participation in a definite social program.

The explanation of this apparently paradoxical situation lies in the fact that today, as for centuries past, the physician makes his living by charging individual patients for individual services, and so long as individual services are the principal source of income of the majority of physicians, there naturally will his chief interest lie. While the development of scientific knowledge in the last fifty years has produced an entirely different conception of the relation of disease to society, of the duty of society to the individual and of the individual to society in the control and prevention of disease, the economic relation of physicians both as individuals and as a body to their patients is still practically the same individualistic relation that it has been for hundreds of years past. The medical student of today still gives the greater part, if not all, of his time to the study of disease as an individual phenomenon, while the practicing physician gives the bulk of his time and practically all of his interest to the treatment of individual patients. It is absolutely essential that physicians recognize the fact that the treatment of diseases of the community are just as much a function of the medical profession as are diseases of the individual and that they endeavor to qualify for the same services in the social field that they have so magnificently performed and are now performing in the individual field.

If they fail to do so, then they must expect to see this field taken over by non-medical workers. This has actually occurred in the last few years in social welfare organizations made up almost entirely of men and women without medical knowledge and in many cases without any scientific training. While an effort has been made to put their theories and practice on a sound basis, the subject is as yet too new, the data too incomplete and the workers as a rule too little trained to entitle social welfare to recognition as a science. Yet it is from this class very largely that the supporters and advocates of so-called health insurance have been recruited, while the scheme itself is probably only the first one of many plans which will be suggested as remedies for conditions which increasing investigation of the field of social medicine are revealing.

It is most important that physicians should understand clearly the significance of the present agitation for health insurance. To regard this movement as an isolated and single phenomenon would be a serious error. On the contrary, it is the result of a long series of causes which reach back to and spring from the same source as the development of scientific medicine. The medical profession itself, through its labors and progress, is very largely responsible for the present situation. For fifty years we have been so busy extending our knowledge of disease that we have had no time to adjust our business methods to conform to changing conditions. While we possess scientific knowledge which enables us to render services of greater value than any other professional group can offer, we have continued to do business on the old basis of so many dollars for so many calls on the individual patient. Yet the medical services which can be rendered and which in the future must be rendered to the community by physicians are of far greater value than any services which we can render to the individual. Medical services have grown in value and importance until under present methods, modern, up-to-date medical attention is beyond the reach of the majority of persons unless they secure it through charity. The proposed plan of health insurance is only one of the schemes proposed whereby adequate medical services can be put within the reach of the average workman. The fact that this particular plan is economically unsound, and that it probably would be ineffective in operation does not relieve us of the immediate necessity of devising some method by which adequate medical services can be made available for every individual needing them.

The proponents of the proposed plan, instead of first studying the situation in

this country and devising a plan suitable to existing conditions, endeavored to transplant entire, from Germany by way of England, a plan unsuited to this country and out of harmony with our social institutions and economic conditions. But if we could tomorrow defeat beyond any possibility of resuscitation the establishment of health insurance in every state in the Union, we should be no nearer the solution of the real problem before us than we were before. There would remain the need, as imperative as ever, of remodeling the economic methods of practice now existing in the medical profession and of substituting for the method of individual services to individual patients some plan whereby each individual as a part of his social right will secure every protection for his health and well-being that modern medical knowledge can give him. The efforts for the adoption of health insurance should be recognized as the beginning of an effort to readjust professional methods to social needs.

In the discussion of this question there are as always three distinct groups: first, the conservatives who desire only that things shall remain as they are; second, the radicals, who look forward with eager vision and often without accurate discrimination toward what they hope will be better conditions and who favor any proposed change in the existing status; and third, the mass of the medical profession who have accepted conditions as they found them and have made the best of them, who are willing to adopt new methods if their value can be demonstrated, who are neither wedded to the past as are the conservatives, nor plunging rashly into the future as are the radicals. I take it that 75 per cent at least of this audience belong to the third class. To you, therefore, I wish to submit the most important and fundamental question in the whole discussion: is social medicine a function of physicians? Is the physician of the future going to restrict himself to the treatment of individual patients as he has in the past, or is he going to assume the responsibility for the treatment of society and of humanity in the mass as well as of the individual? If he is, then he must qualify himself for this work. If he is not, then he can not complain if others take up the work which he refuses to do.

I assume that there is no difference of opinion as to the answer to this question. The medical profession owes it to society as to the individual to render the best services and do the best work of which it is capable. It is inconceivable that the highest type of medical service, whether individual or social, shall be rendered by any other than scientifically trained medical men. But if physicians are going to assume this responsibility, especially if we are going to demand control of this field, as we have of the treatment of individual ills, then we must qualify for social leadership just as thoroughly as we are now qualifying for individual services.

If we are going to assume leadership, then we must have a definite policy. What attitude shall physicians take regarding the proposed plan of health insurance as presented in the model bill of the American Association for Labor Legislation? If this bill is introduced in your state legislature, what attitude should you and your professional associates in your state take regarding it? The organized profession has already gone on record as unqualifiedly opposed to it. But it is claimed by the advocates of this plan that it is a public health measure and that its adoption will result in improved health conditions and increased efficiency. We have shown that the proposed plan will not solve our social problems. What better plan can we propose as a substitute? We have no plan because we lack definite knowledge.

This situation is one which has always confronted the advocates of public health legislation. We have not known in the past nor do we know today the physical, economic and social conditions existing in the various states which affect the health and the efficiency of our people. Our public health program in the last fifty years, while based on the best available information, has been hampered by lack of definite knowledge regarding the prevalence of disease and the physical condition of our people. This fatal defect in the argument for social insurance has also been the greatest obstacle in the development of effective and adequate public health organization and administration. The rational plan to

follow in developing a health administrative body, whether Federal, state or municipal, is first to inquire as to the need and the amount of work to be accomplished. This method has in few instances been followed in the development of public health in this country. A lack of definite, accurate and reliable information is today the chief obstacle in the way of the reorganization of our Federal public health activities and in the state and municipal health organizations. The agitation for the passage of so-called health insurance laws in the different states gives us an unusual opportunity to impress on the public and the legislatures this lack of positive knowledge on physical and social conditions, as well as the importance of developing our state public health activities along rational lines and to the fullest extent. Let us, then, instead of stopping with mere opposition, take advantage of this strategic situation to make a counter attack and to divert the interest in health insurance into a forward movement for better health laws and organization.

To the state legislatures in which a health insurance bill may be introduced we can say:

"We recognize in this bill a sincere effort, unwise though it may be, on the part of its advocates to improve health conditions. But the plan proposed is not in reality a health measure and is not suitable for this country. It affects only a portion of our population and is based on class distinctions that are undesirable and not in harmony with our institutions. It provides only for wage earners of a certain class and is, therefore, undemocratic and unwise. It seeks to develop public health administration through a new and independent body rather than through the recognized and legally constituted health authorities of the state. It is not possible for the advocates of this measure to prove their claims owing to the lack of definite knowledge regarding the sanitary, social and economic conditions which are affecting the health of our people. This ignorance on questions of the utmost importance to our people is also an obstacle in the development of our state health activities. The medical profession is deeply interested, as it always has been, not only in the health of the wage earner, but also in the health, well-being and efficiency of every man, woman and child in the state. It is the duty of the state to protect every man from disease, whether he be employee or employer, wage earner or factory owner, millionaire or pauper, and to enable him to secure and retain to the utmost good health, efficiency and long life. But such state public health work should be for the benefit of every citizen and not for any class. It should be in the form of united action by the people of the state for self-betterment rather than in the form of pauperizing subsidies and emasculating sick benefits. It should be carried on through the legally constituted health authorities of the state and not through a board of representatives of special classes. It should be based on the fullest and most complete knowledge obtainable regarding existing conditions in this state and their bearing on the present physical condition of every man, woman and child therein. As scientific medical men, we insist that any measures for the improvement of our citizens be based on proven facts and not on unproven theories. We, therefore, ask that instead of adopting this incomplete, undemocratic and ineffective measure the state legislature appropriate a sufficient amount of money to enable the state board of health to make a complete and exhaustive study of the entire state, showing the amount of sickness existing among our people, the causes therefor, as fully as it may be possible to determine, the social, economic and industrial conditions existing in the state and their influence on the health of the people, together with any other facts which may be pertinent and to submit a report at the next session of the legislature showing the exact conditions existing, together with the recommendations as to how the existing health organization of this state may be increased and developed to a point where every citizen of the state, regardless of his economic condition or industrial status, may be protected from disease and may enjoy the highest possible degree of good health, efficiency, happiness and long life."

So much for the immediate issue. But what of the larger problem of the relation of the medical profession to the field of

human welfare? This is the second question which we must answer.

If the medical profession is to undertake responsibility for social service as a part of its professional functions, then social medicine and its problems must be more generally, frequently, broadly and intelligently studied and discussed in our medical organizations and medical publications than they have been in the past. If social medicine is to be one of the functions of the medical profession of the future, then the medical student must be given broad and adequate instruction regarding its problems. He must be taught social anatomy, pathology, diagnosis and treatment as thoroughly as he is now taught the diagnosis and treatment of individual diseases. We must begin in our medical schools to teach the medical student social medicine and to develop in the doctor of the future an instinct and a capacity for social leadership.

The issue is plainly before us. Shall we adhere to the methods and practices of the past until we are forced to abandon them, or shall we ourselves recognize, as Lowell said, that

> "New occasions teach new duties. Time makes ancient good uncouth.
> They must upward still and onward who would keep abreast of truth."

Shall we restrict ourselves to the limited field of our professional forefathers or shall we broaden our methods to keep pace with the ever-widening bounds of scientific knowledge? The question is yours to answer, not only for your own day and generation, but for the future of scientific medicine.

DISCUSSION

Dr. E. A. Hines, Chairman, Seneca, S. C.—I may call on all of you to discuss this question. Some of you in the Southland may have thought that this subject, which has taken so large a hold in Germany, England and elsewhere, possibly might reach America in the next generation. But Dr. Green, in his most interesting address, has brought out very clearly that we have to face it now. In 1914 I thought I could foresee that some day we would be discussing this very question, so I paid a visit to the Secretary of the British Medical Association in London to discuss with him the question that is before you now. Unfortunately ultimatums were coming out in almost every newspaper and an extra was out every few minutes, therefore I could not pursue my investigations as I had intended. Nevertheless, the Secretary of the British Medical Association did his best to enlighten me regardless of the pressing matters that appeared in the first hours after the declaration of war. He realized I was serious in my intentions, so for quite a while he discussed with me the battle through which the British Medical Association had just emerged. The smoke of the conflict in 1914 had not cleared away. He told me frankly that there were certain features of the law that had surprised him in their benefits, that a great many physicians who had never earned but a few hundred, or a thousand, in their lives were then earning under the law from two to three or five thousand dollars a year. He very frankly admitted that the advancement of scientific medicine was suffering. But what I want to bring out is that I could see by the tone of his conversation that the British Medical Association had by no means accepted the law graciously, for they foresaw that the basic principles were unsound. I came home and we appointed in South Carolina a committee on this social insurance problem and we put the ablest men in our State Medical Association on the committee. Not a doctor in South Carolina so far as I know (and we think we are progressive) raised his hand or his voice in regard to the whole matter. I fear that has been the condition to a large extent throughout the confines of the Southern Medical Association. We can not close our eyes to this matter, however we may wish to do so. So I am going to call on you in the light of my remarks—and I am in earnest about it—to look upon this matter as of extreme importance and let us discuss it here this evening as it deserves to be discussed. I am going to ask Dr. James A. Hayne, of South Carolina, to open the discussion.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—This is a subject which I can discuss perfectly unbiased, as I have formed no opinion on the subject and have listened with a great deal of interest to the masterly presentation by Dr. Green. His statement in regard to what we medical men are going to do about keeping the leadership in things scientific, whether we are going to take care of the body politic and its diseases as we have, or safely taking care of the individual and his diseases, is a question that is yet to be solved. Already we can see from many sources the restlessness on the part of the public in regard to the attitude which the general practitioner takes towards things social. The general practitioner says that he is with us in everything that pertains to public health. Do his actions prove the sincerity of his statement? We who have to deal with the general practitioner fear that this is not true. He does not report communicable diseases. This is as true of Washington as it is true of South Carolina. It is true of Maine as it is true of Texas, and it takes in the whole United States of America. There is no state in the Union that had adequate reporting of communicable diseases. What is the attitude towards vital statistics? It is an attitude of sullen acquiescence with the law. It is not a cheerful rendering of assistance to the public health officials in this most vital question. Do

they make their reports promptly? Ask any of the vital statisticians of the United States, and they will tell you no. When they do, as I have said before, it is in a sullen acquiescence in the law. Many of them have said that it was contrary to the constitutional rights that they had, that this law should say that a doctor should return his reports. They have gone so far in some parts of South Carolina as to say they will take it to the courts and test the question out. Do they quarantine? Do they instruct the families as to the necessity of the care of communicable diseases to prevent them from spreading from one individual of the family to another individual? If they do that, do they instruct that family how to prevent it from spreading outside of the family circle to the neighbors? Gentlemen, the question is answered if you will go into the rural districts and see how many placards you will find for diphtheria, typhoid fever, or any other disease except smallpox, the only disease which a physician has agreed to quarantine, and the disease which is most negligible absolutely from a public health standpoint of all the diseases we know of. The death rate in South Carolina in the last five years from small-pox is five. There is no other possible disease I can think of that has less mortality than smallpox. For cosmetic reasons we like to keep it away from our ladies, because it does disfigure their beauty. But as far as killing them is concerned, it don't do it. But that is the one disease the medical profession has agreed to call a communicable disease and one in which they are interested from a social standpoint. About five years ago I felt that this thing had come to such an acute stage that with my feeble efforts I would do the best I could; I would at least see that the senior class from the Medical College of the State of South Carolina had adequate instructions as to the laws of the State in regard to what their duties were toward the body politic. Twice a month I hied me to Charleston and delivered a lecture to that senior class on that subject. When they graduated they had learned so much that when I asked the question on their final examination, "To whom should you report the births in South Carolina?" the senior graduate of honor man replied that the births in South Carolina should be reported by telephonic communication to the State Health Office. We have some forty-four thousand births in the State during the year; I would be kept right busy if I answered all those telephonic communications. I don't want you to think for one instant that I am vexed with the physicians for their attitude. I think that their attitude has been brought about, as Dr. Green has so ably shown, by tradition. There are three classes of people in the world that are distinctly individualistic. One is the preacher; no one in his congregation ever talks back to him; he is supreme; his statements are always ex-cathedral. The next person who is always dogmatic and resents even a suggestion is the professor or the teacher, because the pupil or student does not dare to contravert any of the statements made by the teacher or the professor. Now, the professor and the teacher are often right—more often right than wrong—but they have that attitude. The next person who is absolutely autocratic is the doctor. He walks into a sick room and his ipsa dixit remains. If he calls it a disease it is going to be that disease, and he has to stand or fall on that diagnosis, and if they get to questioning much about his diagnosis he puts on his hat and gets up and says, "Get another doctor, I won't stay and be criticised," so that is the attitude of the medical profession. I think we can not help it. It has been brought about by the fact that the doctor has had to practice in an isolated way where he couldn't discuss with his fellow doctors, especially in small towns, because he wasn't usually on speaking terms with his fellow practitioner. Naturally he became autocratic.

Now, what we have got to do—we can't do much with my generation, we can't do much with the generation of doctors which is now practicing, which is the next generation below me. But we can do something with the generation that is coming out of the colleges, and that is one point I want to make today. We must impress on them that when they get the degree of M.D. that degree carries with it a social obligation that is just as great as the obligation to cure a person of a definite disease.

Dr. Hugh Cumming, Surgeon-General, United States Public Health Service, Washington, D. C.—I have listened with a great deal of interest to Dr. Green's able paper, also with interest to the Chairman's remarks of his experience in England, which was about the same as I gathered from a similar experience there.

I feel we are at a critical point now, at the cross roads in this matter. It has been culminating in the last few years and reached an acute point in the last few months.

I feel that our physicians have not entered into this modern conception of the full duty of the physician—that is, the average private physician. He is still, as the doctor says, very individualistic. That has been true with the Government services. I think we have been taught a great deal by the war. I feel very strongly that part of our duty in our hospitals is not only treating the sick and taking them out when they get well, but in adopting the social service so far as our limitations allow. I have talked the matter over with Secretary Houston, who is extremely broad-minded and has had a great deal of experience along that line. So far as our limitations apply, we are now forming a social service which we will endeavor to have reach from the sick man into the local community through local agencies, and keep him in touch with his family, relieve his anxiety with reference to his family, and I think in that way give him just as good medicine as some of the tonics that we prescribe. It certainly accelerates the recovery and the convalescence of the patient to be kept informed of his family's condition. That is a rather narrow conception of social service, but that is as far as we feel we can reach.

When it comes to the rural community, I think the critical point there is, who is going to undertake the social service work? A great deal of volunteer work done is splendid. I think those who saw the work done during the war respect the men and women who carried it on and want to see them continue the work. Nevertheless, I think all of those in the State and Federal health

work appreciate that much of the effort is misdirected. Much of it needs guidance. I think we have got to go half way. I think the doctors in the rural communities—those who are living in the country districts—and I judge from the requests I get for doctors to settle in our country that nearly all of them are leaving the country districts. They have got to be kept together. It has to be done by getting together the doctors in the counties and local communities, the establishment of clinical centers, and the establishment of local rural hospitals which will be available; and the working out from those centers, under direction of the medical profession, of social service work. I believe that is the only solution from the medical profession standpoint that will be practical, and the best from the standpoint of the welfare of the layman.

Dr. Frederick L. Hoffman, Vice-President, Prudential Insurance Company, Newark, N. J.—I would not like to let the opportunity pass to say a few words on Dr. Green's excellent address. I was gratified to note both in his remarks and those of the chairman a new vision of a medical service really meeting the recognized needs of the people. Those who have been opposing compulsory health insurance can not but feel discouraged at the acquiescence and apathy of British medical practitioners in what in my judgment can not be better defined than a mediocre, standardized medical service. The British medical profession deliberately changed a condition of freedom for a condition of bondage, and though a commendable struggle was made to save at least the semblance of independence, the new medical benefit regulations practically established a quasi-public medical service. The British medical profession entered upon its opposition to the proposed legislation in 1911, when it was too late. The fight against compulsory health insurance in this country must be made now, for later it will be to no purpose. Health insurance is a clever device of politicians and social reformers to establish a condition of wage-earners' bondage, under which the interests, both economic and physical, of millions of men and women will be made subservient to an enormous bureaucracy. Social insurance in any form under compulsion withdraws an enormous proportion from wage-earners' incomes to be expended by lay people largely for medical purposes. It is not insurance, but a cleverly disguised form of taxation, falsely asserted to be in the nature of compulsory thrift. All thrift is voluntary, resting upon moral principles of abstinence from current income as a safeguard against the contingencies of the future.

I was five months engaged in my investigation of national health insurance in Great Britain, and I met most of the men prominent in the administration of the act or otherwise seriously concerned with one phase or another. I did not meet one person in authority who did not, by implication at least, utter a voice of warning, equivalent to suggestion, that we had better leave compulsory health insurance alone.

Pious phrases in politics—like pious phrases in reform—merely serve the ulterior purpose of self-appointed propagandists indifferent to the real interests at stake. Mr. Lloyd George, possibly in good faith, made assertions of the most far-reaching importance, not one of which in practice has been realized. He promised adequate medical treatment, sufficient income during illness, excellent sanatorium accommodation and much more in the nature of possible supplementary benefits, none of which promises square with performances.

No nation, however rich, can afford to pauperize its entire wage-earning population without incurring the risk of bankruptcy, both moral and economic. No nation can hold out direct inducements to malinger, to feign sickness or to unnecessarily prolong sickness without paying the price in curtailed production and an increase in the cost of living. In other words, no nation can make the incompetent and unwilling equivalent to those who have energy, self-reliance and practice voluntary thrift.

In this country the agitation for health insurance had its origin with the American Association for Labor Legislation, which is without standing with the Federation of Labor and without standing with industry or the medical profession. It is merely an organization of professional reformers seeking, in whatever direction they can, to enlarge the sphere of their activities. They are chiefly socialists giving furtherance to socialistic aims and purposes opposed to the aims and ideals of a free democracy. They have seized upon the so-called socialization of medicine as a clever device to lure the public by false pretenses as regards enormous sanitary and other benefits possibly resulting from such legislation. They are silent as to the facts of the situation, but give utterance exclusively to fallacies and to worn platitudes unworthy of serious consideration.

The objective of the socialization of medicine is to destroy the status of medicine as a profession. In England the profession is hopelessly divided into panel doctors and those who continue to practice medicine privately and exclusively. The trend today in England is towards trade-unionism in medicine, and the Medico-Political Union courageously faces the facts of a situation as alarming as it is deplorable. The Medico-Political Union intends to fight for the rights of the medical profession by the only methods which have been found successful, on the principle of collective bargaining through a well-supported organization holding its members to absolute obedience.

There is a vast amount of unrest in England as a result of the recent change in remuneration, which is considered far from adequate. The profession stood out for 13s. 6d. per capita, but the government offered 11s. and carried its point. Yet there were those who believed that the 13s. 6d. itself was inadequate and that at least 15s. should have been granted. On all essential questions of adequate remuneration, unlimited size of panels, unrestricted right of transfer of panel practice at death or retirement, income limitation or the common law right of an appeal to the courts the British Medical Association lost its case and the government carried its point.

British National Health Insurance is today as complex and involved as the German system. The rules and regulations are innumerable, and the man does not live who masters more than a fraction. The documentary evidence is overwhelming and yet is insufficient to disclose the workings of what has become a colossal bureaucratic and auto-

cratic machine. It will be said that there is not much opposition on the part of medical practitioners to the system at the present time. For that matter there is no opposition to the poor law on the part of those who receive poor law relief. All both want is more money and easier rules and regulations. The mediocre practitioner unquestionably has had his economic status advanced, but the earnest, ambitious, highly intelligent practitioner finds his practice reduced to a deadening routine, being chiefly concerned with trifling ailments and many cases which do not involve sickness at all. The principle of per capita payment for medical service is thoroughly vicious, being merely an adaptation of the old form of club or contract practice, condemned by every medical association which has investigated the subject.

Panel practice today is limited by statutory orders to 3,000 names. But that is merely a maximum limitation and in practice a number of insurance committees have gone down to 2,000 names, and even less. The smaller the panel, of course, the more difficult it is for the doctor to make a proper living. If there are 14,000 panel doctors and 14,000,000 insured persons the average panel is about 1,000 names. As new doctors enter the profession—and the medical registration was never as heavy as it is now—competition for panels must become more and more serious and suggests, if not in force, a further panel restriction, probably to an ultimate limit of 1,000 names, if not even less. This will leave no alternative but to work for a higher per capita remuneration, for the opportunities for private practice are being more and more curtailed. The income limit, which originally had been fixed by the British Medical Association at £103 was agreed upon as £160 in 1911, but changed to £250 in 1919, and suggestions are now being made for a further raising of the limit to £320. The higher the limit, of course, the more restricted are the opportunities for private practice, yet every panel physician, broadly speaking, carries on such private practice as he can find. Serious complaint is made that there is unjustifiable discrimination in favor of private patients as against panel patients whose treatment in certain cases resembles that of poor-law beneficiaries. The time given to patients in consultation is less than five minutes, and in some cases not more than three and a half minutes on the average, obviously concerned chiefly with very trivial complaints, if not downright cases of malingering. Panel patients complain frequently of unsatisfactory service, and the practice is growing of employing physicians at private expense to secure such treatment as the case may call for.

I have visited perhaps one hundred bedside cases in congested industrial districts. I have examined more than 2,000 individual reports made by sick visitors. The facts disclosed by my own investigations are absolutely appalling. Every week the British Medical Journal prints letters of complaint on one phase of the act or the other. The literature is so enormous that no one can hope to master its intricacies, but it will be sufficient to point out that there are ten volumes of closely printed Supplements to the British Medical Journal, which contain a truly astonishing amount of evidence available to anyone who desires to know the facts.

So much with reference to medical practice. An equally strong indictment can be brought against pharmaceutical practice or the drug administration under the act. The allowances for medical and surgical supplies or appliances are ridiculous. Everything that is really needed is wanting, while the articles which anyone can afford to buy for a few pence are made available. There is no provision for nursing, nor for hospital treatment, nor for surgical operations. Provision has recently been made for consultants, but it remains to be seen whether the services rendered will be satisfactory. The prosecution of physicians for overprescribing is a common occurrence. Drug administration has become purely an economic function, in which the primary consideration is the protection of the drug fund, to the obvious injury of the patients' interests.

Since much has been made of the value of panel medical service in its relation to health conservation and health progress, it may not be out of place for me to add the results of my investigations on this point. I have personally visited a large number of health offices throughout England and Scotland, and I have amplified my personal investigations by letters of inquiry to practically every health department of Great Britain. I am absolutely convinced that not one iota of evidence can be brought forward to prove that the public health administration has been advanced in any direction whatsoever through health insurance. I have gone over near two thousand reports of "visitors," disclosing the most appalling housing conditions and sanitary neglect, but in not a single instance was a recommendation made as to the direction in which the evil might be done away with. Health insurance has no relation to disease prevention, but merely to its amelioration and possible cure. Those who care to go further into this aspect of the question should read a recent work by Sir James Mackenzie on "The Future of Medicine," than which no stronger indictment has been framed against the misconception that doctors engaged in the practice of medicine as a healing art are at the same time health officers more or less in disguise. In his evidence, appended to the Report of the Inter-Departmental Committee on Medical Records, Sir James Mackenzie takes occasion to say: "The purpose of the National Health Insurance Act is to provide for the prevention and treatment of ill-health occurring among the industrial classes of the community." But "Legislation on matters of health depends upon the state of medical knowledge at the time, and as medical knowledge is not complete or stationary at any one time, but is defective and transitionary, it follows that the regulations must be drawn up in such a way as to enable them to be adapted to advances in medical knowledge, and also to provide and encourage opportunities and efforts for progress in medical science." These objectives are not realized under panel medical service, largely because the defects in medical knowledge are rather standardized and stereotyped than brought to light for the purpose of correction and change. Sir James Mackenzie also takes occasion to say that "There is an idea current that diagnosis in the majority of cases is so simple that little difficulty should be found in recognizing from the patient's symptoms the nature of the disease

from which he suffers, and scheduling it under a definite classification." Yet instead of more time being made available, more thoroughness being insisted upon, more care being made imperative, the tendency today is in directly the opposite direction, in that the treatment is extremely superficial and in countless cases certificates are given where the patient has not been seen at all.

These observations are called for by the numerous articles in the lay press in which reflections are cast upon the doctors as to what they have not done or in what direction they have failed to meet public expectations. The doctor fills the most responsible position in the civic community. As long as he remains true to his profession and to his obligations to cure the sick and to bring relief where cure is impossible, he will continue in the high esteem in which he has been held for generations past. But the doctor is not a quasi-health officer, is not engaged in the prevention of disease, which represents elements and considerations totally at variance with those which underlie the practice of medicine as a healing art. In England the doctor can no longer prescribe what he would like; he can not leave his office when he would like; he can not take the patients he would prefer; he can not make the charge for his services that the services may call for; but he has become largely a medical clerk and been deprived of his rights and privileges to practice a profession in the light of his own conscience and for a reward commensurate to the services rendered.

It is most fortunate for the American medical profession that it has been aroused to a consciousness of the danger that threatens its future and that there is now practically a united front in relentless opposition to the nefarious activities of social reformers, whose allegiance is rather to the Socialistic party than to the American republic. But much remains to be done. Eternal vigilance alone will safeguard the interests of the profession and the American public against the ever-present possibility of renewed efforts which may assume directions wholly unanticipated. There has been a change of front and the new effort will probably be for unemployment insurance and for maternity benefits, which are essential elements of the whole scheme of social insurance under which the wage-earner passes into the complete grasp of an intrenched bureaucracy. With his income mulcted to the extent of 10 or 15 per cent weekly; with his body subject to countless inspections and examinations; with his labor time apportioned as may be directed by the authorities; with his leisure time controlled as may be considered best, the wage-earner will become as the German workman has become—a mere creature of the state, subject to rules, regulations, control and direction without end.

I have an abiding faith in the American medical profession—that it will be true to its sacred policy at the annual meeting held at New Orleans and oppose health insurance in any and every form in which its interests and those of its clients are concerned.

Dr. A. T. McCormack, State Health Officer, Louisville, Ky.—It seems to me we have gotten away from the remarkable address delivered by Dr. Green. I think this is the most practical statement that has been advanced by any man in the presence of a medical organization in a generation. The American Medical Association, had it done no other thing than to have given Dr. Green opportunity to make this study and to present its results, would have accomplished a great deal for the betterment of health conditions in the United States.

I am impressed that his statement has closed the chapter as far as health insurance is concerned to those who are capable of understanding the plain reading of the English language, and that other plans of opposition to its foibles are futile. He has opened a new vista to those of us who patriotically, earnestly, sincerely desire to see the clear road and to know what to do in the solution of the problem presented to public and health officials.

Neither do I subscribe in any degree or in any way to strictures on the medical profession, even when made by that prince of cynics and most subtle of humorists, my distinguished friend from South Carolina. I think there is no profession about which exactly such criticisms can not be made. In the medical profession it is not the physician who is at fault personally for failure to practice preventive medicine. The thing basically responsible is the system of education that trains them. That is right.

I want to say now and here that if Dr. Green would perform the greatest service he can for the medical profession and the people of the United States, he will take this paper and take the time to read it to every member of the Council on Medical Education of the American Medical Association. And then, when he has gotten through reading it to them, he should read it at the Federation of Medical Colleges or see that it is read. Even if he has to go himself and read it, let it be read at the meeting of the faculty of every medical institution of the United States, especially the young ones who are still not ruined by having themselves so case-hardened that they can not write new literature. When we stop to think of the progress in public health in twenty years, during the professional life time of most of the people in this audience, and that the doctor today is taught only forty-five times as much as he was twenty years ago—then he had one hour's lecture in a three years' course, now he has forty-five hours in a five years' course—it is to weep! The lectures are very rarely delivered by an orator so persuasive or teachers so well taught as the distinguished health officer of South Carolina who succeeded in getting telephonic reports of births returned from 44,000 babies in his State.

The first thing we can do in the South—Dr. Welch can do it in Alabama, Dr. Williams in Virginia—is to stop asking ten out of the hundred questions on examination of the candidate for a medical license in chemistry. I respectfully submit that not one ten-thousandth of his knowledge should be chemistry, as important as chemistry is. Ask him at least ten questions on examination on public health and the schools will find out their system is wrong as soon as the students don't pass in public health. Then we will be meeting the issue squarely. We are trying to get these lessons across to the people in another way here under the leadership of some of our distinguished

teachers in Kentucky. I have heard some of the finest talks by our leaders like Miss Yancy and by the presidents of our normal schools. All the distinguished leaders in education tell about the influence of physical education, regretting much of the tommyrot being taught to the children in the public schools. The children are taught the number of bones, the number of layers in the skin—things the doctor forgets as soon as he is taught them and never uses again. Yet those things are taught to all the children in the public school, where they are dying by dozens of diphtheria and other diseases due to ignorance. I have heard teachers talking about this thing, urging other teachers to study and try their level best to put it across. It will never be done until a few of the smart ones that have political sense get hold of the examinations and begin to ask sensible questions instead of foolish ones. That is true in every line of education.

I want to say we have a compulsory course in physical education. Every teacher gives thirty minutes a day to a course in physical education approved and prepared by the State Board of Education in co-operation with the State Board of Health. That manual has gone into the schools. Though illy prepared at the beginning, we have made the beginning that is going to deliver to us health officials a generation of people in a few short years that will have a health consciousness and a health conscience—the thing you and I don't know about. We can only dream about the feasibility of what can be accomplished by a man who knows what physical health is, who is conscious of it. He demands it because it is his right. We have heard prating since the beginning of the Christian era, I might say, about the inalienable rights of man, the right of trial by jury, and a lot of other things. The only right left that is not taxed is to have a birth certificate and a death certificate. I have wondered all my life what the six years were intended for before the child started to school. It never dawned on me until recently that it is for the purpose of having a wise doctor and thoroughly trained public health nurse examine that child, find his defects and help his parents to relieve them before the time comes to start to school. We have been wasting those six years.

I want to ask Professor Hoffman—he knows a lot more than he says; he has a wide field of knowledge that he can expose for your benefit, as he frequently has for us health officers, who admire and love him—I want him to name for me a new chair just established in our School of Public Health. We have asked one of the leading men of Louisville, who has had the greatest experience, to deliver a course of lectures on a systemic, periodic examination of well folks, beginning with the babies and ending with the adults. We have been trying our level best in Kentucky, through an intensive campaign, to get well people to go to doctors and have an examination made. We have found in a large majority of cases that the doctors don't know anything about well persons. I never saw a well person professionally until I examined recruits for the Army. I never heard a well lung. I never put my ear against a chest in my whole medical practice unless I suspected something was the matter. When I began to examine recruits I was astonished at the first test or two that sounded different from any of those I ever heard before. They were normal chests. That is absurd. It is ridiculous that the people of this State can not get that examination. A young woman came to me the other day, from my old town, to whom I had written urging her to have an examination. The local doctor said she was one of the best looking women he ever saw in his life. She needed no examination. She came up here for a physical examination. She saw fourteen men at an expense of five hundred dollars and was told one tooth needed attention. She learned she had a first degree flat foot that produced no symptoms in her left arch—all that at an expense of five hundred dollars. She thinks the doctor in her home town is an ignoramus but an honest man, and that the group up here know how to make five hundred dollars very easily, both of which are true. The examination here was absolutely outrageous, scientific and soulless. The lack of examination down there was a farce.

What every doctor should know is how to start in and examine a baby without clothes—like Dr. Bradley does. No doctor is competent to practice preventive medicine in this country today unless he knows that. There is no medical school in the United States today that is turning out a single solitary man that does know it. That is where we are, and we have got to correct it. That is the field we have to cover, the lesson Dr. Green has advanced, and we have to get the vision back to the teacher. We have a hard problem in this physical education. Our teachers are anxious to know how to conduct these classes they are directed by law to teach. Have we anybody who can teach them? The average lecture on physical education will put any crowd to sleep. In our school of public health we have instructed the teachers that when a teacher gets up and uses big words as a camouflage that they can not understand, they have the privilege of going to sleep or getting comfortable chairs and reading. The result is the teachers stop talking nonsense. If we did that in the medical school it would be a good idea. The idea of buying an electrocardiograph to see the circulation of the blood—you might as well teach a course in running a flying machine! You can not run the electric cardiograph until you get electricity in the country. You can not use a flying machine until you get a landing place. Neither is of any use. We are getting to a place where we are prostituting the medical profession in the Temple of Science. We are making it a soulless profession. I want to say today I feel profoundly grateful for hearing this splendid address, and I hope every man will turn back to clinical teaching, putting the laboratory down as a hand-maiden of science, not as the director and controller of medical education. If we can do that we can then train our doctors who are going to be health officers, to train our nurses who are going to be public health nurses so they will not be individualized, but so each will be multiplied by the knowledge they have and be useful to larger groups of people. Then when we go before legislatures we can get what we want. At present we are doing what we learned in the Army to do scientifically and carefully—all the time trying to get some other

fellow to do the job. That is what we do in the Army—as colonel, I turn it over to the major. He calls the captain; he calls the first lieutenant, and so on until it gets to the sergeant and the sergeant sees that the thing is done. That is what we have today in this medical profession. We have got to get busy and train the doctors so they are really useful. The most gratifying thing I have ever seen is to see the nurses that came from our school last year and who are now doing public health work in Kentucky. The future of public health work, to my mind, depends first on our being able to give the vision that Dr. Green has laid before us, and then training and educating a personnel who can deliver the goods in accordance with that vision. They are attempting to lure us away; they are attempting to subsidize our profession and educate all the humanity out of it. I will tell you frankly, so far as I am personally concerned, if any member of my family were sick, outside of the realm of surgery itself, I would prefer to have them doctored by any one of those country doctors I know than in the most scientific training center in the United States. I have faith in the country doctor as a remedial agent. I have faith in the sincerity of his soul and heart, in the breadth of his knowledge. He can not know much about preventive medicine and won't know much until he is taught while in medical college. If I made a claim that the doctors knew nothing about preventive medicine in this State, I would feel like adding that all they don't know is what the State Board of Health has failed to teach them. They are making reports of deaths and births in this State. If they didn't I would feel that we had failed. It is such an obvious duty that any man can be made to understand its purpose, and he can not help making those reports when he does understand.

We must go before our people with an attractive programme. I would rather have written that paper of Dr. Green's than any other paper I have heard in the last twenty years in any medical society. I would rather be an honest reader and an honest believer in the future of medicine than to do almost anything we hear about in medical societies. I look forward to the future of medicine with renewed assurance of its usefulness in public health because he has read that paper, provided each person here sees that everybody else reads and knows about it and sees that it is acted upon. It is really a privilege to have discussed such a paper.

Dr. Green (closing).—This question is such a vast one that any amount of discussion might be carried on in regard to it. It is impossible to do anything more than to touch on one or two points. I am gratified at Dr. Hoffman's affirmation of my statement, that so-called health insurance is not insurance, essentially that it is an economic problem, and not a health or medical problem. I discussed the experience of the British medical profession in the first paper which I wrote, but I was obliged to omit that in order to save time. The mistake the British medical profession made was that they paid no attention to the question until it had been formulated in permanent form. The British medical profession for years had been out of touch with the general public. Lloyd George, who in 1910 was comparatively new in government circles, borrowed this scheme of social insurance from Germany and presented it as a sop to the workmen and socialists of Great Britain. He did not regard it as a health problem or a medical problem, as is shown by the fact that in drafting the bill he consulted employers, labor unions, insurance companies, the friendly societies (analogous in this country to the fraternal benefit associations)—practically everybody interested except physicians. He never approached them or asked for criticisms or suggestions until the bill was ready for introduction in Parliament. Then he practically said, "Here is the bill we are going to introduce. You can take it or leave it." The British medical profession made a serious tactical blunder, which I hope the medical profession of this country will avoid. They opposed the bill for health insurance solely on the ground that the compensation offered was not sufficient. The result was that they put themselves before the public as opposed not to the general principles of the proposition, but only to the remuneration and the terms of employment. That was practically a confession to the public, and the public so regarded it, that they were willing to accept the plan provided they were paid enough; and immediately the medical profession was put in the position of opposing the bill not because it was economically unsound, not because it was harmful to the well being of the people, but because there was not enough money in it for them. The British public said, "The only reason why the doctors are against it is because they don't get enough." The same tendency has been shown in this country in medical journals and medical associations, to confine the discussion almost entirely to the question of compensation. This is a secondary question.

Don't labor for a moment under the impression that the fight on this question is over. It is not. It is just begun. The bill has been introduced in fifteen legislatures. If I am not mistaken it is going to be introduced this winter in thirty-six. In every one of those states it will have to be fought. The question for the medical profession to determine is on what basis to fight it. There are plenty of objections to it. It will not do what it proposes to do. It is an inadequate solution of the problem. It is not needed, and it is not a health measure. We must develop leadership and take the lead in organizing public opinion for a proper solution of the problems we all know exist.

The matter Dr. Hines referred to has developed since I prepared this paper. Last week the Council on Health and Public Instruction put in two days discussing the problems of social medicine, the relation of the medical profession to the public and the duty of the medical profession. The council will at the Boston meeting, I hope, have a constructive program to present to the House of Delegates that will at least suggest an adequate substitute for health insurance and will outline a policy by which the organized medical profession can assume leadership in this field and can organize public sentiment.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

SURGICAL MONSTROSITIES AND MONSTER GROWTHS*†

By Lucian H. Landry, M.D.,
New Orleans, La.

The title I have chosen may be misleading, so I shall therefore begin by clearly defining its scope and purpose. As the term monster is defined lexicographically in many ways, it may be

1. Anything extraordinary, supernatural or wonderful; a thing to be wondered at; a prodigy.

2. It may be a fabulous animal of grotesque or chimerical figure and often of huge size, compounded of human or brute shape, or of the shape of various brutes, as the sagitary, centaur, faun, mermaid, sphynx, minotaur, griffin, cyclops, dragon, and manticore, in which the mythology, legends, fables and fairy tales of every nation, of every age and of every clime abound.

3. It may be a matter of size. Any very large animal, or anything unusually large of its kind, well illustrated in surgery by the enormous proportions that certain tumors or tissue growths may attain. The term is also often and properly applied to the gigantic creatures that prowled over the earth in the early geological epochs long before the advent of man. In the jurassic period of the mesozoic era, we have learned that the dinosaur, iguanodon, pterodactyl or dimorphodon, the phororachus, the stegosaurus and 57 different varieties of that frightful band of saurians, dominated the earth. These ferocious monsters (for they must have been monsters to have attained the size of 40 to 60 feet in length) are happily long extinct and have made way for other less appalling and more useful creatures.

"For in this changeful world in which we live,
A slight adaptive power will often give
Great steps in life to some, while those in whom
Such power is not, sink slowly to their doom."

4. Then again, when we are speaking in medical or zoological terms, the word monster without other qualifications is understood to apply to prenatal deviations in the development of the embryo or aberrations from normal births whether it be by excess, deficiency or accretion. These are especially familiar to the obstetrician and to the embryologist and constitute the now complex and difficult science of teratology. It is to these prenatal aberrations that the term monster is most legitimately applied in our professional vocabulary, as the Greek etymology of "teratology" (teras—a monster) which was introduced by E. Geoffroy St. Hilaire in 1832, clearly implies. But it is not with this most interesting type of monsters that we are concerned; while the word "teratoid" and the embryological relations of the monstrosities that we shall exhibit in our pictorial gallery will be frequently referred to, I shall make it plain that it is not my purpose to invade the teratologic domain.

Then again, there is the psychologic monster, the individual regarded with horror because of his moral deformity or because of his propensity to commit revolting or unnatural crimes. With this class which furnishes food for thought of the criminologist, the sociologist, the moralist, the novelist, and the journalist, we have no concern on this occasion.

Our title, "Surgical Monsters and Monstrosities," might be stretched to a discussion of some of the immoral monsters who infest and disgrace our profession as they do the legal, ecclesiastic and other highly specialized intellectual groups in the arts and sciences, proving merely that men are

*A pictorial review illustrated with sixty lantern slides showing many unusual and passing forms of a gross pathology that is rapidly disappearing with the advent of modern preventive and aggressive surgery.

†Chairman's Address, Section on Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

men whenever and wherever they may be and that as such they are subject to the same monstrosities of mind as they are to those of the body. But to come to our subject—and let me dismiss at once the suspicion that I am to impose upon your indulgence by any pretentious or exhaustive exhibitions of mythologic, paleontologic, teratologic or psychologic lore, for even had I any pretention of learning in any of these special fields of inquiry — which I have not—I would surely not choose this occasion to indulge my proclivities. No, gentlemen, the role that I expect to play today is much humbler and far more modest, but I trust if not delectable at least more gratifying. For I propose to "personally conduct you" (if I may be permitted to use the hackneyed phrase of a Cook's guide or a Ciceron) through the tour of a gallery of pictures which, while not possessing the artistic merits or the esthetic qualities of the Louvre, the Vatican, the Dresden, the Prado or other famous repositories of art—and in fact would be dubbed merely as a "Chamber of Horrors" by the uninitiated, has, to the thoughtful surgeon, the one merit, that it gives him a vision of the passing shades of a monstrous pathology that is rapidly marching to its last resting place in the solemn memories of a dead past in the history of surgery. For it is to the credit of the surgery of the present day that these gigantic and often hideous excrescences of the flesh are becoming rapidly extinct by the weeding and reaping processes of surgery. Far more that the actual extirpation of these ugly giants of pathology that I shall exhibit to you, the real merit and glory of surgery is in its preventive and prophylactic influence; its power to nip these in the bud and in destroying the seed before it has attained its overwhelming and life-sapping growth. It is the wide diffusion of surgical knowledge and the progress of the aseptic technic which has given confidence in its methods and safety in its results that have made it acceptable to the masses, and so to say "popular" to use the current expressions of the days, that have made the early recognition and destruction of the monstrous specters of the past a dead or dying memory, and that has given its greatest triumph.

It is not to exhibit the marvels of surgery in its technical achievements, in coping successfully with pathologic monstrosities in the operating theatre, that I have chosen this subject. It is to emphasize the fact that these monstrous forms are becoming rarer, less conspicuous and less sensational in our clinics. Thanks to the greater confidence of the people in the security given by our methods, which permit of an earlier and more timely resort to surgical diagnosis and treatment, the surgeon of today has become one of the most active and efficient agents in the prophylaxis and cure of disease. What has become of the immense giant hernias that were conspicuous in our hospitals only two or three decades ago? these immense scrotal and umbilical pouches which projected below the knees and even lower, which held almost the entire intestinal content of the abdomen, including some of the greater viscera?

These were monstrous eventrations which gave the unfortunate victims double abdominal cavities in which the abnormal compartment was infinitely larger than the normal, thus making the reduction of the huge prolapsed mass impossible. The original abdominal cavity then repudiated its former occupants as alien intruders who had long lost their right of domicile or fellowship.

Even after the advent of aseptic surgery, which emboldened surgeons to attack them, no hope of reduction or cure could be entertained except by reducing the length and bulk of the herniated and prolapsed intestines by wholesale enterectomy. In this way great physiological sacrifices had to be made and the risk of the operation was enormously increased. These great hernias have entirely disappeared and are seldom, if ever, seen in our clinics.

The laity has learned how safe and certain is the cure by operation, so that no one waits for the scrotum to enlarge or the umbilicus to protrude. All hernias are now attacked and cured in their incipiency, practically at all times and at all ages. The making and application of trusses is rapidly becoming a lost art, just as the making and use of pessaries for uterine displacements has been relegated largely,

though not always justly, to the antiquarian in gynecology. And since we refer to gynecology, what has become of the many ovarian cysts and uterine fibroids that astounded all beholders with their almost incredible exhibition of human endurance and survival in spite of the crushing and life-sapping burden that they imposed upon their victims?

We have records in the nineties of uterine fibroids weighing 93½ pounds. McIntyre, at Washington, D. C., recorded a case of a woman weighing 199½ pounds before operation and scarcely a hundred after; other giant growths weighing 60, 50 and 40 pounds are reported by Eastman, Keith and Tait. Many more similar instances could be duplicated, especially in our Southern hospitals in which this pathology has found its most notable examples in the procrastination and ignorance of the negro race.

We need not retrace our steps further than twenty-five or thirty years. The cystic fibromas of the uterus attain still more prodigous size. In the case of a negress operated upon by Stockard in 1884, the tumor weighed 135 pounds. As for the pure ovarian cysts, the records of the curious and colossal show that of these there is no end, even within the last quarter century when abdominal surgery had fully asserted itself.

Think of ovarian cysts weighing 152 pounds (Briddon), 132 pounds (McGillicuddy), 149 pounds and 182 pounds (Reifsnyder, 1895), containing 22 gallons of fluid; 146 pounds (Rodenstein, 1879), 116 pounds (Kelly), 89½ pounds (Keith), 80 pounds (Gregory), 65 pounds (Boerstler), 70 pounds (Bixby), 70 pounds (Alston), 80 pounds (Cullingworth, 1895). In this last case, a girl 16 years of age, weighed 170 pounds on the night of the operation and 79½ pounds a week after the operation. But it is a superfluous task to quote further examples of these monstrous products of human pathology which abound the literature of scarcely three decades ago.

Those who are interested in this phase of pathological monstrosities need go no further in their search than 1897, when the encyclopedia of the "Anomalies and Curiosities of Medicine" was published to the lasting credit of American medical literature by Gould and Pyle.

Those who are fond of the curious and the rare will find here in this unique and vast repository of learning an inexhaustable research, all the material needed to satisfy the most ravenous appetite—and, what is more to the purpose, to compare and contrast the surgical experience of the recent past with those of the living present.

Judging by the example of the past and the recorded achievements of our immediate predecessors, theirs must have been a War of Titans and ours the conquest of dwarfs; for, what we now do seems small and trivial in comparison. They seem to have slaughtered the giant denizens of the primeval forest and left only the small imps, gnomes and elves to bag as our game. However, on rare occasions, an apparition of this sort startles us in our clinics with its mammoth-like resemblance, reminding us of the old traditions. Then we are as much surprised as if some strange, wild and savage creature had strayed into our back yard, as if a royal Bengal tiger had made his appearance among a litter of kittens. While these comparisons may appear strained and metaphorical, it is none the less true that the group of anomalies which are monstrous by mere accretion or unrestricted growth, as we see them in tumors, are becoming rarer year by year, and it is this rarity coupled with questions of a more complex interest which are related to the pathogeny and classification of these growths that have led to their preservation in our pictorial gallery.

I can only claim a small contribution to the large collection of pictures that Dr. Matas (with whom I have the great privilege of being associated) has accumulated for years and has generously placed at my disposal for this occasion. These photographs have been gathered chiefly from that vast treasure house of human pathology, the Charity Hospital of New Orleans, and from Dr. Matas' private clientele. I am also indebted to Dr. Matas' clinical lectures and demonstrations in which many, if not the majority of the patients have been presented and commented upon as "surgical nightmares"

and "spectres of a vanishing past," for the selection of "surgical monstrosities" as the subject of this discussion.

As the time limit on the program calls for brevity, I have made no attempt at a systematic or methodical presentation of the subject. I have limited it to some of the most striking cases, chiefly tumors, which, owing to their size and other unusual characteristics, are worthy of record and exhibition as "museum specimens."

There are two groups, however, to which I especially desire to direct your attention, as they have a special fascination for us in our clinics and have stocked our collection with very notable examples: the group of fat tumors and hypertrophies which illustrate the anomalies and aberrations of fat distribution and the monstrosities which result from the unrestricted overgrowth of fat tissue. Of these the specimens which show monsters by mere obesity or general adiposity, are too numerous and familiar to detain us long. From time immemorial fat men, women and children have been the object of curiosity and the number who have exhibited themselves is incalculable. Nearly every circus and dime museum has its examples and some of the most famous have been, in this way, able to accumulate fortunes. When a fat man or woman can attain a weight of 739 pounds (the famous Daniel Lambert) or 616 pounds (Edward Bright) or a fat woman tilt the scale at 850 pounds (a North Carolina negress referred to by Gould and Pyle), or a man like Beddoes, who was so immensely fat that a lady of Clifton (England) called him "a living feather bed," or, still another, like a certain Dr. Stafford, who was so enormous that, at his death, he was deemed worthy of the following epitaph:

"Take heed, oh good traveler! And do not tread hard,
For here lies Dr. Stafford in all this church yard."

—Gould and Pyle.

And when we read of a woman who is 5 feet 1 inch high and carries a waist of 5 feet 2 inches, with breasts one yard in circumference, which hung below the umbilicus, with an abdominal apron that drops like a balloon skirt a la mode below her knees, we realize the possibilities of fat as a monster maker. We are dealing, then, no longer with obesity, but with large, animated and ambulant lipomas. To the purely practical surgeon, the interest attached to fat when it attains these elephantine proportions, lies in the problems of reduction by the pruning and carving of the knife. Unfortunately, not many of the deplorable victims of the adipose diathesis are fit subjects for surgical operation. In consequence of their defective, vicious or disordered metabolism they are feeble, cardio-vascular asthenics and visceral degenerates who are easily shocked and made toxic. None the less, numerous cases of lipectomy (Howard Kelly, 1910), in which excision of large blocks of abdominal fat has been successfully effected, and which can be seen in nearly every large clinic of the country, whether as a mere fat-reducing measure or as an accompaniment of umbilical hernioplastics, show that surgery can often accomplish in one sitting what the therapeutic metabolist can scarcely do by diet and other therapy after months and years of patient treatment.

After dismissing this familiar topic with a few striking examples, I shall exhibit several large regional lipomas (solitary tumors); one, especially, of enormous size which you will recognize on the neck of an aged negro, which he carried on his back like Sinbad's "old man of the sea," for over fifty years. It grew from the nape of the neck and rested upon his dorsal spine. It was only when he grew old and feeble and tottered under the weight of it that he consented to part with it. It was successfully amputated by Dr. Charles Chassaignac, at the Charity Hospital of New Orleans, in 1890, and the old darkey returned home with a bent back, which he was never able to straighten after it had been moulded into an arch by the great weight which, Atlas like, he had supported for over a half century.

I shall also show you interesting instances of congenital monolateral and regional fat hypertrophies of the subcutaneous fat that gave the parts an elephantoid appearance. Such is the case of a little girl with a congenital lipomatosis of the right upper

half of the thorax and corresponding upper extremity which I am able to reproduce through the courtesy of Dr. Scott, of Temple, Tex., who also gave us an opportunity to examine the patient.

There is also a picture of a rare congenital anomaly in a child, otherwise well proportioned and physically perfect, which appeared at birth in the right lower extremity as a congenital lymph-edema, which ultimately became a hypertrophic lipomatosis such as is described as "lipomatous pseudo-elephantiasis congenita" by Mathier, Potain and other French authors.

There is also another picture of a rare congenital anomaly of the foot, of elephantoid appearance, which appeared in a little Mexican boy of cretinoid mentality in whom a progressive hypertrophy of the adipose tissue gave the appearance of a localized gigantism. A partial plastic amputation was performed by Dr. Matas and the study of the tissue revealed a character of fat which was different from that of ordinary adipose tissue, which differentiates many of the congenital or fetal lipomas from those of the adult adiposities in numerous and striking ways.

This case invites a brief reference to a new field of inquiry in adipose histogenesis that has been recently opened by the researches of Battyshaw, Hammar, W. Cramer and others in the discovery of the frequent persistence in post-natal life of a peculiar tissue which retains all its germinal activities as an embryonal glandular organ. Apart from its possibilities as a neoplastic entity it is endowed with close affinities with the thyroid and adrenals and is a strong link in the embryonal endocrine chain.

It is not improbable that some of the congenital fat tumors or lipomas occurring in the neck, axilla, perinephric region and elsewhere are examples of the persistence of the embryonal fat which in the past, for lack of better means of differentiation, have been classed by surgeons and operators with the true lipomata. This gland-like fat tissue, as it has been called, may persist for some time after birth. It occurs normally in the mouse, guinea pig and many hibernating animals. According to Battyshaw, this tissue occurs normally in the subpleural tissue, axilla, neck, and around the kidneys. In the human subject, the accumulation of this glandular fat, as observed in the neck, has attained the dignity of a separate anatomical organ and has been described by Hatai (1902) and by Bonnot (1908) under the name of "interscapular gland." According to Bonnot, it is "pink in color and lobulated, presenting much the appearance of fresh pancreas," and is thus grossly recognizable in the adult subject. This tissue undergoes hypertrophy under conditions of deficient thyroid secretion. In human cretins circumscribed swellings of "fatty" tissue have frequently been noticed to occur in the neck and axilla. This fact was first described by T. B. Curling as early as 1850 as fat of a loose, lobular structure, and by Hilton Fagge in 1870 (Cramer).

In most species the characteristic histological appearance of the cells of this tissue disappears soon after birth and the majority of authors state that it is transformed into the ordinary type of adipose tissue where it may, no doubt, give rise to isolated or symmetrical lipomas of the ordinary adult type. Of this we know but little. In some species, e. g., white rat, tame mouse and the hibernating animals, it retains its characteristic appearance.

It has been shown that this tissue, which is very vascular, is functionally distinct from ordinary adipose tissue. The fatty material which it contains is rich in cholesterin compounds and other lipoids in addition to ordinary true fats. This load of lipoid is retained under conditions of starvation which bring about the disappearance of ordinary adipose tissue.

Evidence has been furnished, especially by W. Cramer (British *Journal of Experimental Pathology*, August, 1920), that it is functionally related to the thyroid and adrenal glands. A particularly close relationship exists between the lipoids of this tissue and those of the adrenal cortex. It is evident that this fat tissue is an organ of great functional activity and hitherto unsuspected importance in embryonal life, second, perhaps, only to the adrenal glands themselves. It is properly an endocrine organ—a "lipoid" or "cholesterin" gland and, like the adrenal, it is intimately re-

lated to the metabolism of the lipoids and cholesterin. This relationship is at present conjectural, but enough has been done to show that this glandular fat is to be regarded as an additional link of great importance in the endocrine chain.

I have punctuated this particular type of fat tissue because of its only recent discovery and because its relation to the fetal and postnatal lipomas is yet in the dawn. A new field of pathologic and histologic research is now open. But much will have to be done to determine the relative frequency and pathogenic characteristics of this tissue, especially in its differentiation by recently discovered histologic methods from the ordinary lipomas.

Another group of lipomas which will be exhibited are the regional, diffuse lipomatoses of the adult, of which the "fat neck" of Madelung, on the symmetrical adeno-lipomatosis of the neck, of Launois and Bensaude, are notable examples.

We have seen several cases of this type in Dr. Matas' clinic and particularly recall one of these which caused great deformity in the neck of an adult man, who was successfully operated upon by him. The tumor consisted of six distinct lipomata of spherical contour, each the size of a baseball, with three of these on each side of the median line of the cervical spine, forming a fat cushion extending from the external occipital protuberance to the suprascapular regions. I regret that the excellent photographs of this remarkable specimen have been accidentally lost and are not available.

We also have slides illustrating that now familiar type of painful or neuralgic adiposis or Dercum's disease which is so often associated with general obesity, but which in our experience has more often appeared as a regional and unsymmetrical lipomatosis in otherwise well proportioned subjects.

We have had a most notable example of adiposis dolorosa, or Dercum's disease in a young woman of normal weight, and otherwise well proportioned, who exhibited a diffuse lipomatosis in the outer two-thirds of the right thigh. The lipomatous tissue was too diffuse and intimately adherent to the derm to permit of extirpation without an immense sacrifice of skin, but the neuralgic pains and hyperesthesia of the mass was relieved by division of the external cutaneous nerve under local anesthesia. In this case the fat hypertrophy was limited solely to the affected limb. The fat distribution was normal everywhere else.

We also have examples of that interesting lipomatoid condition, often observed in thin subjects, especially in tuberculous or ill-nourished subjects, which Dr. Matas has described as a "disseminated, nodular, subcutaneous lipomatosis," in which small encapsulated lipomata are felt as palpable subcutaneous masses of various sizes, from that of a pea to that of a chestnut. They are irregularly distributed under the skin of the upper extremities, from the wrist to the shoulder, but no further, and vary in number from a dozen to fifty or more in each arm. Sometimes they seem to follow neural or metameric lines, but this is far from constant. They are, however, as a rule, symmetrical and often associated with an annoying, burning pain. They are easily excised by separate enucleation and shelled out of their capsule, as we have done on several occasions under local anesthesia. But, as a rule, they are too numerous and disseminated, too much like an eruption, to justify any direct surgical treatment. This type of disseminated, symmetrical lipomatosis of thin subjects, though long since recognized, has not been sufficiently studied as a clinical entity, though its pathogenic relation with the symmetrical, diffuse lipomatoses of the extremities is quite evident. The symmetrical lipomas of the neck, the unilateral hypertrophies, the hemihypertrophies involving half of the body, whether to the right or left of the median line, which are always congenital, or of one-half of the body, below or above the waist, as described by Weir Mitchell; the lipomatosis dolorosa of Dercum, and the monolateral neuropathic elephantoid edemas of childhood, ending finally in a true lipomatosis (Potain, Mathieu and others), are all, notwithstanding their polymorphous clinical characteristics, plainly different offsprings of the same parents.

Finally, closely allied to the monsters of pure obesity is the now familiar adiposity

of endocrine origin, depending upon disorders of the pituitary, pineal, thyroid, and, in fact, all the glands of internal secretion, which has been classed as adiposis of cerebral origin (adipositas cerebralis), distrophia adiposits, genitalis, hypophyseal adiposo-genital syndrome of Froelich. Of these, we have had our share of notable examples, congenital and acquired, and we will only mention them to complete the survey of the adipose group.

Without skimming the surface of the great problems that remain unsolved in the study of the pathogenic relations between the members of the great adipose family, we may conclude that the two great causal agencies that are here brought into play are the central nervous system as the regulator and controller of fat distribution and the endocrine system as the regulator of fat metabolism. We can easily conceive of disorders of the endocrine system which account for excess and deficiency in fat production in the organism as a whole. We can conceive of disorders in the distribution of the fat only on neural and metameric lines, such as are exhibited by the symmetrical lipomatoses and the unilateral, hemilateral and other systematic localizations of fat and of the lipomatous distrophies—without the intervention of the central and possibly the peripheral nervous system.

I. P. Lyon sums up the lipomatosis problem as follows:

"It has been attempted to show that the several groups of cases of subcutaneous fat deposit, whether diffuse or circumscribed. do not constitute separate clinical and pathological entities, but rather varieties in the expression of a common morbid process; that this process may involve a profound and widespread disturbance of the organism, with a resulting complex constitutional symptomatology; and that this symptomatology varies within wide limits, tending sometimes to more or less individualization and constituting thereby clinical varieties or groups of cases not sharply defined.

"The etiology of the process is unknown. Only two views, connecting the process with disturbances of the nervous system or of the glands of internal secretion, seem broad enough to harmonize with all facts. These two views are not necessarily opposed, but can be resolved into one by assuming that the nervous system is secondarily disturbed by primary disturbances in the glands of internal secretion or vice versa. The complex mutual relations between all of these glands are considered and the view suggested that one or more or all of them may be considered in the pathogenesis, and that the variation in the symptomatology of the different groups and cases may depend on the varying degree of involvement of these several glands and of the nervous system."

Heredity as a factor in the etiology is pointed out and the cases exhibiting this relation are reviewed.

We have now done with this bird's-eye view of the great larder of human fat, which, when moulded by the capricious hands of Nature in her wayward and eccentric moods, lends itself as a material of extraordinary plasticity to the casting of some of the most bizarre and grotesque of effigies of the "Human form divine." When melted in the crucible of the chemist and analyzed by the scrutinizing methods of the morphologist, microscopist and biologist—this material is capable of yielding precious secrets which may ultimately teach us how to unravel the mystery that still hides their birth. In this way we hope to lighten the great toll in misery and unhappiness that these monsters of the adipose world exact of a vast suffering humanity.

Before closing the tour of our museum, I will ask you to cast a glance at a representative of an entirely different group of giant tumors. You will see that it exhibits an enormous pendulous tumor which is partly cystic and partly solid, which hangs like a huge bell-clapper from the sacrococcygeal region to the knees. The picture was taken of a young woman born with this defect. It was diagnosed as a congenital teratoid growth at the Charity Hospital, but was never removed. Therefore, its histogenesis was never positively and conclusively revealed. In this way a splendid contribution to this most intricate and curious relic of embryonal existence was lost to scientific inquiry.

What a manifest opportunity for embryologic and photographic pathology the words "teratoid" and "teratoma" suggest. How tempting to plunge into the great sea

of scientific speculation that tumors of this class, and especially of this region, have opened to the thoughtful and inquisitive minds of some of the most learned in our profession!

Gould and Pyle, in the introduction to their encyclopedia, say:

"To the highest of philosophical minds it is the usual and the ordinary that demand investigation and explanation. But even to such, no less than the most naive minded, the strange and exceptional is of absorbing interest, and it is often through the extraordinary that the philosopher gets the most searching glimpses into the heart of the mystery of the ordinary. Truly it has been said, 'fact is stranger than fiction.' In monstrosities and dermoid cysts, for example, we seem to catch forbidden sight of the secret work room of Nature and drag out into light the evidences of her clumsiness and proof of her lapses of skill—evidences and proofs, moreover, that tell us much of the methods and means used by the vital artisan of life—the loom, and even the silent weaver at work upon the mysterious garment of corporeality."

Enough said of the monsters and hideous giants of the world of disease and of surgical pathology. In parting, can I close without a bow of reverence and gratitude in memory of the giant-killers who have eased the way to our professional labors? to the heroic Odysseans of our profession?

This place and occasion are not needed to remind me that when speaking in the very heart of Kentucky, I am standing on a soil made fertile for humanity by the blood of the early torch-bearers of civilization in their struggles with the savage foes of progress and enlightenment. And I need not be reminded that out of this soil came one of the world's greatest giant killers, who, typifying the indomitable spirit of the American pioneer, alone and unaided (except by the fearless courage of his own convictions) conquered and slew the monster who till then held woman chained to the rock of hopeless torment.

I bow reverently and again to the memory of Ephraim McDowell, the Kentuckian, the father of ovariotomy, one of surgery's bravest knights and humanity's greatest benefactors.

THE INCIDENCE OF KIDNEY INFECTIONS IN ACUTE APPENDICITIS*

By R. M. Harbin, M.D., F.A.C.S.,
Rome, Ga.

In a series of nine hundred complete examinations by our associates during the present year, there were one hundred and twenty-five consecutive laparotomies for intraperitoneal diseases in which there were thirty-two cases of acute appendicitis, while there were fourteen abscess cases, the diagnosis of which was not called in question. In this series there were four cases associated with active kidney infections, and it is very common to find that a case of suspected appendicitis turns out to be a kidney infection. In the absence of routine methods, this discovery may be made after operation, especially in cases of pregnancy. But this phase of the question does not concern the present discussion.

Right-sided symptoms of infection of the renal pelvis and ureter interfering with drainage very closely resemble those of acute appendicitis, and the difficulty we have experienced in differentiating these uncommonly coexisting conditions justifies the attempt of a detailed report of same. We frequently have the one or the other of these two pathologies to eliminate in diagnosis, and in their coexistence a failure to recognize the presence of actual appendicitis constitutes a serious danger. We are prone to discard the diagnosis of appendicitis upon the discovery of characteristic findings of renal infection.

In dealing with a case of acute appendicitis, it is of utmost importance to make an early diagnosis. At first this is easier to do, since duration of the disease only increases the difficulty of diagnosis. Of course, it is easier to establish the presence of a kidney infection than it is to diagnose appendicitis. It should be borne in mind that there may be pronounced history of bladder symptoms with an entire absence of evidences of kidney pathology. The association of these two pathologies leads us

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to believe that they are of common origin, and that they have proceeded from infected tonsils, abscessed teeth, colds, etc. The infection seems to have a selective action.

In chronic diseased conditions of the kidneys and appendix, the problem of diagnosis is not urgent and is more easily worked out. By the use of ureteral catheterization and the x-ray, renal pathology can be excluded. Yet failure to carry out these details is reflected in statistics by Judd (*Annals of Surgery*, February, 1920) who reports fifty-four cases out of four hundred operations for ureteral stones, or 13 per cent, who had been appendectomized elsewhere.

Case 1.—Mrs. J. H. L., age 44, a stout mother of six children, had had no miscarriages. Her personal and family history were negative except for a femoral herniotomy twelve years previously. She was admitted to the hospital December 13, 1919, with a temperature of 100° and pulse 112. Four days previously she had a mid-abdominal pain radiating toward the right iliac region with some vomiting and general aching. There had been no previous attacks of acute pain. After the first day the abdominal symptoms were less marked and her bowels had promptly responded to laxatives. There had been no history of bladder symptoms. The systolic blood pressure was 130, diastolic 80, and there was very slight tenderness over the right iliac region. Some pain and slight rigidity were revealed in the pelvis by vaginal examination. Urinalysis from catheterized specimen showed specific gravity of 1026, a great amount of albumin with many granular casts and a few pus cells. The combined 'phthalein test was 20 per cent in two and one-fourth hours and the x-ray examination was negative. Blood showed hemoglobin 90 per cent, red cells 4.4 million, leucocytes 11,000, polymorphonuclears 94, small lymphocytes 4, large lymphocytes 2. As the diagnosis was doubtful, it was deliberated for twenty-four hours with the same urinary findings. The leucocyte count then was 12,400 and polymorphonuclears 90, small lymphocytes 5, large lymphocytes 5. Two members of the staff diagnosed acute appendicitis with nephritis while a third diagnosed pyelo-nephritis. Operative findings were a perforated appendix with a small burrowing abscess into the cul-de-sac. The incision was closed with a stab drain and drainage per vagina established after removing the appendix.

Increased leucocytosis with a high polymorphonuclear count along with the first day's clinical history prompted the diagnosis of appendicitis. The fourteenth day after operation the urine showed a small amount of albumin with an occasional granular cast and an increased amount of pus.

It is probable that she was carrying a low grade of nephritis from infected teeth which was accentuated by pus in the peritoneum.

Case 2.—F. L., a stout overgrown boy 13 years old from an adjoining state was admitted to the hospital February 2, 1920, with a temperature of 101° and pulse of 68. Personal and family history were negative, although he had been a heavy eater. Two days previously he had a sharp pain about the navel, which shifted later to the right lower abdomen, the temperature reaching 102°. There had been no vomiting and no pain in the back or bladder symptoms. The bowels had moved well from calomel. Pain over the appendix was slight or negligible, and urinalysis showed slight albumin with a quantity of red blood and pus cells. Leucocyte count was 19,000 with 84 per cent polymorphonuclears, small lymphocytes 10, large lymphocytes 6. Tonsils were unusually large and cheesy. At first it was believed to be a receding appendicitis, but after four hours' deliberation it was diagnosed 75 per cent appendicitis and 25 per cent nephritis in symptomatology because of increased leucocytosis and character of the primary clinical history.

Operation revealed a much enlarged and inflamed appendix containing necrotic spots and the incision required drainage. His convalescence was uneventful and tonsillectomy was advised. He soon began to suffer with rheumatic pains which persisted irregularly for three months. Tonsillectomy was then performed, which relieved him entirely. The tonsils were evidently the original focus of infection.

Case 3.—E. Y., 22 years old, a stout college girl with a negative family history, had had two years previously an acute right abdominal pain, and had had a severe cold for two weeks. Twelve hours before entering the hospital May 19, 1920, she was seized with a severe right lower abdominal pain with vomiting and tenderness. Her pulse and temperature were normal. Leucocyte count was 22,000, polymorphonuclears 91 per cent, and urinalysis showed specific gravity of 1,006 with a slight amount of albumin and a considerable number of red blood and pus cells. At this time she was entirely free from pain and deliberation was advised. But in ten hours the acute pain recurred and appendectomy was promptly performed showing a very tense kinked and injected appendix. The incision was closed without drainage and five days later urinary findings were negative. An x-ray of one devitalized tooth was negative.

Case 4.—Mrs. B. S. F., age 27, ill-nourished, married nullipara, gave a history of tonsillitis and had had six or eight attacks of acute epigastric pain covering a period of four years. The patient had had some pain and vomiting for twelve hours after admission. Her pulse and temperature were normal. Systolic blood pressure was 110, diastolic 70. Catheterized specimen of urine showed a specific gravity of 1022, acid reaction, moderate amount of albumin and considerable pus, but no history of urinary disturbance. Leucocyte count was 17,000. Three months previously her red cells were 5.3 million, leucocytes 14,000, polymorphonuclears 79, hemoglobin 79 per cent. There was an entire absence of abdominal tenderness. Diagnosis was doubtful and was so

explained to the patient. An operation was advised on the grounds of expediency because the symptoms and history were of characteristic attacks. She had increased leucocytosis, vomiting and normal temperature in the presence of pus and albumin in urine. Our most common symptom of abdominal tenderness and rigidity was absent, but operation revealed a post-cecal appendix, enormously distended with pus, the walls being reduced to membraneous thinness. It would have been disastrous to temporize with a case of this type. Ten days later urinalysis showed a negative report.

CONCLUSIONS

1. While mechanical conditions of the appendix may be at times a causative factor, these observations warrant the belief that there are metastatic infections of the appendix and kidneys that seem to have a selective action and point to the existence of some common focus.

2. A greater danger lies in assuming that the actual symptoms of appendicitis are of kidney origin and in suspicious cases extreme caution should be practiced before excluding the diagnosis of appendicitis in the presence of evidence of renal pathology.

3. The characteristic first day's clinical data of an increasing leucocytosis with moderate temperature in the presence of albumin, blood and casts in the urine would tend to prove the existence of an acute appendicitis. In order to avoid contamination it is important that specimens of urine should be obtained by catheter.

4. In the absence of violent symptoms of appendicitis, there may be cases of doubt in which it is prudent to deliberate for twelve to twenty-four hours for additional leucocyte readings, which are usually progressively higher in appendicits.

DISCUSSION

Dr. M. Y. Dabney, Birmingham, Ala.—I would like to ask whether there were any urinalyses made in the sense of catheterized specimens from the ureters. However, the mere fact that the patient has appendicitis does not rule out a urinary infection, nor does infection along the urinary tract rule out appendicitis. Neither condition renders the patient immune to the other. I would like to know whether the cases were examined later to see whether the infection had cleared up. In cases of stone or ureteral stricture several careful urinalyses should reveal the presence of pus and it would be of great interest to work up those same cases with those possibilities in view.

Dr. LeRoy Long, Oklahoma City, Okla.—Twelve years ago I had occasion to think about this subject in a rather systematic way for the reason that I had observed cases of appendicitis that simulated pathology of the right kidney or the right ureter. At that time I reported a series of cases illustrating three types of pathology. The first type was illustrated by the case of a woman in which a diagnosis of appendicitis was made, but during the attack there was pain along the course of the ureter, accompanied by other symptoms common in connection with irritation of the ureter. The latter symptoms were so pronounced the operation was deferred. Subsequent examination by x-ray and otherwise demonstrated that there was no evidence of kidney or ureteral pathology. The patient was finally operated for appendicitis during the quiescent period. There were no evidences of pathology outside of the appendix. In that case the symptoms, in my judgment, could be explained on account of the common origin of the nerve supply going to the ureter and appendix.

The second type was illustrated by the case of a man who came with a typical history of acute appendicitis. He had a rigid abdomen and a high leukocytosis. A diagnosis of appendicitis, with probable rupture, was made. However, one of the outstanding symptoms in his case—in fact, a very trying symptom, was a terrible priapism from which he was suffering when he entered the hospital and continued for some time after the operation. In his case there was a gangrenous appendix with rupture, leaving no doubt at all as to the true pathology. The priapism was explained upon the ground that there was great irritation about the ureter on account of the appendix being close to it the ureter being involved to a certain extent in the inflammatory process.

The third type was illustrated by the case of a coal miner who came with an appendiceal abscess, there being a typical history of acute appendicitis preceding the formation of the abscess. After the operation, and during the time that pus was being discharged from the wound by way of drainage tubes, large quantities of pus were passed through the urethra. In this case it seemed to be a reasonable hypothesis that the inflammatory process started from the appendicitis had invaded the walls of the ureter to the extent that there was disintegration of the walls with rupture, permitting the pus to find its way into the lumen of the ureter. It may be a matter of interest to know that the patient finally recovered and was able to resume his occuption as a coal miner.

I doubt the correctness of the statement that we do not have a high leukocyte count in infections about the kidney. I have observed cases with a very high count, but usually with high fever, the latter not being present in the average case of acute appendicitis.

Dr. A. L. Blesh, Oklahoma City, Okla.—The question brought up in this paper of post-operative right-sided abdominal pain is indeed a live one and perplexing as well. Every surgeon of experience has had many post-operative returns of the pain for which his operation had been planned and which it had failed to relieve. It can be said that we still have with us a "no man's

land," which as yet has not been accounted for surgically in the right side of the abdomen. Acute conditions are comparatively easy to diagnose. It is the chronic complaints which offer the difficulties in diagnosis, yet at times even the acute abdomen is not easy. The retro-peritoneal appendix will sometimes offer a very puzzling syndrome, especially if in the course of its migration it has been hung high in the right side. It will most certainly not offer the classical clinical picture so beautifully portrayed by Murphy. Muscular rigidity will be conspicuous by its absence. Chills, which are not common in a typical case of appendicitis, will often be present because the toxins are absorbed directly from the cellular tissues behind the peritoneum. Also, septicemia lurks not far in the background. The evolution of renal diagnosis in conjunction with the x-ray is limiting more sharply this "no man's land," many of the painful conditions having been found to be due to urinary tract disease of one kind and another.

Dr. M. F. Bledsoe, Port Arthur, Tex.—While we recognize that we many times have very great difficulty in correctly diagnosing some of these borderline cases, we do not want to become discouraged because an infected kidney or a stone in the kidney is found in a patient who has previously been appendectomized. I would rather assume that the patient had appendicitis at the time of operation. It may be that subsequent observation will lead one to conclude that there may have existed at the time of the illness from acute appendicitis, some kidney infection which was not so apparent, neither was it of so much consequence. We do believe that the kidney is susceptible to focal infection. It is not unusual to have a pyelitis following an operation for appendicitis. There is no reason why an appendix, acutely inflamed, progressing to abscess with surrounding peritonitis, directly alongside or lapping over a ureter, will not give symptoms of pyelitis. We can not afford to delay operation in these cases if we determine that we have a pus appendix. This type case impresses us with the very great necessity for more careful history taking and clinical study, together with our various laboratory tests. We can, by this means, surely, if we are careful, arrive at a correct diagnosis. There are so many things that may give pain in the right side that we must be careful before operating at any time. Partial obstruction contracture of the psoas porvas, etc. The mere fact that there is, or may be, some infection of the kidney should not preclude operation on the acute appendix, for it is the very type of appendix that may demand surgery. The diagnosing is sometimes confusing, but if we will go back to our original clinical methods of examination, very careful history taking, together with our combined laboratory examinations, we can make these diagnoses correctly and operate at the proper time. There should be no excuse for much trouble in a differential diagnosis in chronic appendicitis. I don't personally think there is much to chronic appendicitis. Unless symptoms of partial obstruction, due to adhesions or kinking or something of that kind, chronic appendicitis, in my mind, does not exist.

After all, very careful clinical history taking, physical examination with laboratory findings properly interpreted, the proper conclusion can be arrived at fairly easy.

Dr. Richard A. Barr, Nashville, Tenn.—I wish to agree with the previous speaker, Dr. Bledsoe, that the subsequent discovery of a kidney stone is not *prima facia* evidence that appendectomy was not justified. I have seen several operations at Rochester for kidney stone where stones had previously been removed. I guess if it is proper to remove a stone, where a stone is found later it is proper to remove an appendix under similar conditions. I think there is something like 10 per cent of recurrences following removal of kidney stone, and so we should not say that 14 per cent of previous appendectomies in cases of kidney stone is particularly high. With the utmost care it is sometimes impossible to tell whether we have renal infection or appendiceal infection or a combination. I think we should in cases of serious doubt remove the appendix—take a chance of somebody's catching us later in having done an apparently unjustified appendectomy. We are, of course, not justified in not making every possible effort to make a correct diagnosis. I did not notice that radiographs were made in the case reported by Dr. Harbin. Certainly the radiographic examination is necessary, and certainly it would be necessary, if the white count is of any definite value, to pass a ureteral catheter and be sure that the ureter is open. You are not apt to get much of a leucocytosis from pyelitis unless the ureter is blocked and a closed ureter would certainly be an important point in differentiation. After doing everything we can we will still be in doubt at times. The appendix is a dangerous organ and I think we had better occasionally make a mistake and remove an appendix that did not have to come out rather than take the risk from remaining in doubt.

Dr. A. J. Crowell, Charlotte, N. C.—I wish to mention one point of differentiation between appendicitis and kidney infection which was not mentioned in the paper. Pressure on the descending colon will always produce pain in the appendicular region in acute appendicitis and will not increase pain on the right side if due to ureteral stone. This is true in the subacute cases and occasionally may be elicited in the chronic.

The high leucocyte count in appendicitis is another point of differentiation. It has been our experience that the leucocyte count in pyelitis does not run anything like so high as it does in appendicitis. Of course there are cases of very virulent appendicitis in which the leucocyte count is not high. In such cases we always consider the prognosis is grave.

Dr. Mischa Casper, Louisville, Ky.—I would like to ask if the doctor has made any observation of leukocytosis as to the proportion in the retro-peritoneal and the normal position of the appendix in the cavity. I have been making this observation myself and would like to have his opinion in closing.

I recently had a case which refers to this subject. It was not worked up as well as it should have been on account of its being a very acute case. The patient was a woman eight months pregnant with an acute abdomen. She was vomiting and had all the other symptoms of an acute obstruction. We operated upon her at night, very hurriedly, and found no cause for that obstruction. Since then I have thought there was some error in my opinion. We did a Cæsarean on that woman and she went home from the hospital in good shape except an infected catgut stitch down deep in the wound. Eight weeks later I was called again in this case and found very much the same set of symptoms. We operated on her again very hurriedly, but we made a leukocyte count each time. I think the first time it was 9,000 and the second about 11,000. The second findings were these: I examined the appendix the first time very carefully and found no pathology and came to the conclusion that it was the uterus, or the pressure of the uterus, that was causing the obstruction. Anyhow, the symptoms were relieved after the Cæsarean section. The appendix was examined carefully and if I ever saw a normal appendix it was that one. I think there is ample reason as a rule for taking out the appendix and do usually, but I thought it was hardly justifiable in a Cæsarean section to take out such a normal appendix, and hence this appendix was left in after being examined. Eight weeks afterward this appendix was very greatly inflamed and a mass (thrombosed vein) extended clear up into the cavity. It was well walled off and had no connection with the appendix or appendix region. In addition, we removed the appendix and the woman had had a history of cystitis with pus in the urine and our urinary findings were deceiving. It looked like a thrombus in the vein which extended up nearly to the vena cava, and in examining this I happened to feel the right kidney and it was a large sack of pus, the kidney tissue being practically all destroyed. We took out the appendix and drained the kidney, and while the woman was desperately ill for several days, she finally got well. How this great amount of apparently disconnected pathology could exist in one case I can not say. She evidently had an infected vein, and the sinus connecting with the uterine cavity. I think the case is pertinent to the discussion and I want to report it more in detail after I have it properly worked up. I can not understand the interrelation between all these conditions.

Dr. William T. Black, Memphis, Tenn.—Frequently we are in doubt as to the diagnosis between an acute kidney condition and an acute appendix. I believe, however, that if a careful history is taken, plus the clinical findings, with an x-ray picture and a urethral catheterization, that we will seldom make an error in diagnosis. A urinalysis, which is always made in every case, will usually show albumen, casts, blood, pus and epithelial cells in either condition, but such findings should not lead us to believe that it is a kidney case, for we find this condition in various forms of infection. Many years ago when a patient had the above urinary findings we were inclined to believe the case was one which should not be operated upon, but now we realize that all acute or sub-acute cases present these findings. The toxemia producing these urinary findings will promptly clear up upon removal of the focus of infection. At times, in instances of acute or sub-acute salpingitis, which does not demand an immediate operation, we should have made a functional test of the kidneys before the time set for operation. At times the operation may have to be postponed for a few days in the latter condition until the functional test shows the kidneys to be better. The cases which confuse us in making the diagnosis between an appendix and a kidney trouble are those which have a misplaced appendix, and here the history plus the various findings will usually clear up the case.

Dr. W. P. Harbin (closing).—I want to thank you all for the discussion, and say in reply to the doctor who asked about the ureteral catheterization that this was not done in these cases. Another question I can not answer, that of the doctor about the leukocyte count in retro-peritoneal and appendix abscesses, and where you have abscesses elsewhere. I have not made any study of that.

I want to refer first of all to a mistake that we made years ago, and I also want to refer to a mistake recently made by a colleague of ours. A good many years ago we took a boy's appendix out and at that time he had a little pus in his urine. We thought it was due to acute infection of appendicitis, but in about six weeks the boy came back and was in another attack of "appendicitis," from his point of view, after his appendix was taken out. The boy in the beginning did not have appendicitis, but had pyelitis.

Recently I was called in consultation to see a patient operated upon by a colleague in a woman about seven months pregnant. He took her appendix out very promptly after her first symptoms appeared, the woman having a high temperature, 102-103°, but after the appendectomy she continued to run a high temperature for three weeks. This woman, after about ten days, had premature labor and almost lost her life, but did get well. Referring to his case and mine makes it rather fair to discuss it. This woman did not have appendicitis at all, but pyelitis. Her urine was not examined microscopically before operation, but was examined for albumin and sugar.

This year I have seen three cases of apparent appendicitis in women who were pregnant. In all three cases there was pain over the appendix. In all three there was pus in the urine. All three cases were treated by giving enormous quantities of water and they went on normally throughout labor.

I think the speakers have put the thing better than I could by saying that the most important thing is the clinical history. You may watch your urinary findings, have pus in the urine and pay no attention to it and go back to a good clinical history and probably get more than from any laboratory findings. It is the same old story—nothing is of so much importance as the

good history. I think we can sometimes have an appendicitis and pyelitis together. We may have some infection in the appendix from the kidney, and very often in the kidney we have infection which will come from the elimination of infection from the appendix, and this makes it sometimes very difficult to make the diagnosis. I think what some of the speakers have said is very important, that you had better play safe and take the appendix out, but exhaust every resource for diagnosing the condition before you do it.

URETERAL CALCULI*

By A. J. Crowell, M.D., F.A.C.S.,
and
Raymond Thompson, M.D.,
Of the Crowell Urological Clinic,
Charlotte, N. C.

If the urologist consulted his own inclinations, he doubtless would operate upon every patient coming under his care suffering with impacted ureteral stone who was not relieved spontaneously in a reasonable length of time by morphine, heat locally or a general anesthetic. He is, or should be, willing to forego the performance of a beautiful operation if the same results can be obtained by local manipulation even though the work of the operator be more arduous and prolonged.

After having followed systematically since 1915 a plan of local ureteral anesthesia and dilatation for the removal of impacted stone (described in previous papers and illustrated in lantern slides which we will show you) we are firmly of the opinion that such results can be obtained with far less fatalities and with no more damage done the kidney than that following surgical operative procedures.

A review of the literature on the subject shows that about 40 per cent of the cases of ureteral calculi consulting the surgeon have been operated upon, and that there was no effort made to remove them by cystoscopic means. The fatalities following these operations ranged from 10 to 20 per cent, to say nothing of the unpleasant results, suffering and hospital expenses. The end results were not satisfactory in many of them if we are to judge from the reports of the operators. We believe that even the minimum of 10 per cent fatalities in the hands of the surgeon of today is far above that necessary for the relief of this condition.

The removal of ureteral stone by mechanical means has long been advocated by Bransford Lewis, Beven, Kretschmer, Young and others. No mention has been made by them, however, of injecting local anesthetics into the lumen of the ureter as a routine in removing these calculi by cystoscopic manipulation. To our knowledge, no one has ever reported a large series of consecutive cases treated successfully by the cystoscopic methods we advocate. We believe this is due to the failure on the part of the surgeon to recognize and utilize the great advantage gained by using local anesthetics, as well as their failures to persist in their cystoscopic manipulations. We have frequently demonstrated both the relief of pain and ureteral relaxation by local anesthetics. As a result of the relaxation we have been able to pass the ureteral catheter above the stone in every one of our cases, which otherwise might have been impossible in many of them. The necessary cystoscopic manipulation for this work can not be accomplished in many cases without a local anesthetic. For this purpose we use a 2 per cent solution of procain and have had no unpleasant results following it.

Dr. Howard A. Kelly, as early as 1900, described a method of anesthetizing the ureter. He injected cocain into it through the vaginal wall by means of a hypodermic syringe. Drs. Bevan and Kretschmer, in 1909, suggested the topical application of solutions of cocain, eucain, sterile oil, and glycerin through the ureteral catheter as aids to the passage of the ureteral stone. They did not report their results, however, following these applications. The same thing is true of the suggestion made by Bransford Lewis in 1900. All of us are familiar with the advantages gained by local anesthesia in cystoscopy and other urethral instrumentation, but have failed to take advantage of this knowledge in our ureteral work.

Since it occurred to us that we could inject a solution of any of these anesthetics into the ureter through the ureteral cathe-

*Read in Section on Urology, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

ter and obtain ureteral as well as urethral anesthesia, we have removed without a fatality 76 out of 78 consecutive cases of ureteral calculi coming under our observation. A stone was removed from the kidney pelvis by this method in one out of the 76 cases. In the two remaining cases it was necessary to resort to surgical operations in order to remove the stones. It is interesting to note that these two patients gave us more trouble than all the rest combined. In fact, one of them refused to pay his bill and threatened to sue us for damages because of the persistence for several months of a urinary fistula. The second patient had a slow recovery and finally drifted to the Johns Hopkins Hospital, where, we understand, the kidney was removed. Naturally we are glad to find a more satisfactory way of handling these cases.

Because of the constriction at the site of, and the dilatation above, the impaction, persistance of urinary fistulae following ureterostomy is very frequent. Many nephrectomies have been performed on account of such results. Complications requiring nephrectomy seldom occur following cystoscopic manipulation. So far we have not had to resort to it.

The length of time the stone had been impacted in these cases ranged from a few days to five years. The size of the stones was from that of a small grain of wheat to that of a chestnut.

The question of damage done the kidney by the loss of time necessary for removal of the stone by cystoscopic manipulation naturally comes up. If the impaction is recent and the obstruction complete, the catheter should be passed above the stone and left in for twelve to twenty-four hours. In this way it not only dilates the ureter and acts as a drain for the kidney, but through it the kidney pelvis can be lavaged and treated if desired. Should the obstruction be chronic and incomplete, it is not an emergency case and manipulative efforts are certainly justifiable. Surgery can be resorted to at any time should it become necessary.

We believe pelvic lavage following the removal of ureteral stone by any method is a very important procedure in order to prevent recurrence in cases complicated by infection. In our opinion infection predisposes to stone formation, as expressed in a previous paper. Lavage is more practical following removal by cystoscopic than by surgical methods.

The number of treatments required to succeed by cystoscopic manipulation depends upon the location of the stone, its size, the length of time it has been impacted and the functional activity of the kidney. The latter plays an important part since the flow of the urine has a tendency to force the stone downward. For this reason the recently impacted stone is removed much more easily than the one of long standing, and especially is this true where the obstruction is complete. Failure is inevitable if impaction has been sufficiently long to produce complete and continuous anuria. We believe that all the recently impacted stones in the adult, where instrumentation is possible, can be removed by this method. Of course, it is not applicable to children or to men with enlarged prostates or other conditions making ureteral catheterization impossible. Very frequently one dilatation is sufficient, but in other cases quite a number may be required. The average in our experience in 76 cases has been 4.76 treatments per patient.

The pain and reaction following manipulation is another problem to be considered. We all know that pain is frequently severe following an ordinary ureteral catheterization, and espeially is this true after each of the first treatments. Because of this fact, we give ¼ grain morphin hypodermatically immediately after the treatments. In this way the morphin begins to have its effect by the time the procain anesthesia subsides, and it prolongs the ureteral relaxation. The patients soon become accustomed to the treatments and submit to them readily. We recently had under our care a patient who came forty miles to our office every other day for treatment and performed the work of a field laborer between treatments. In order to emphasize the way in which patients become accustomed to this work we wish to cite a case now under our observation. This patient has only one kidney and it is enormously hydronephrotic and badly infected. For three months he was cathe-

terized daily, and for the past seven months every other day with only one slight reaction.

CONCLUSIONS

1. Practically all recently impacted ureteral calculi can be removed under local ureteral anesthesia by cystoscopic methods with less fatalities and less injury to the kidney function than is obtained by surgical operative procedures.

2. The success of the method depends upon complete ureteral anesthesia and dilatation, the skill of the operator, and persistance in his manipulations.

3. An effort should first be made to remove the stone by this method, since no harm is done the patient by it and surgery can be resorted to at any time necessary.

4. If crowned with success, the fatalities are far less, much time and suffering are saved, and a return of the condition is less liable.

DISCUSSION

Dr. John H. Neff, University, Va.—I feel that we are much indebted to Dr. Crowell for his advocacy of the use of local anesthetics in the ureter as the first step in the various cystoscopic procedures employed in the removal of ureteral calculi. We have been using 10 per cent novocain for this purpose since we first saw an article by Dr. Crowell on the subject several years ago. We think the novocain has been very valuable not only from the point of view of the patient's comfort, but further in facilitating the passage of instruments past the stone. We have been able to secure the passage of the stone in about 90 per cent of cases and consider the ureteral anesthetic an important contributing factor in these results.

We agree with Dr. Crowell that attention should be given to such residual pyelitis as exists after a stone has been passed or removed. In several recent cases, however, we have found upon ureteral catheterization five or six weeks after stone removal that the pre-existing heavy infection had entirely disappeared. This finding would certainly suggest that the infection was secondary rather than primary and such we believe to be the case in most instances.

Dr. J. L. Boogher, St. Louis, Mo.—I have been very much interested this morning in this symposium on the ureter, and only want to speak of a possible feature that might be of some aid not only in diagnosis, but sometimes it will be a great relief to the patient.

In all diseases of the ureter or the bladder or the genito-urinary tract, if there is no absolute necessity for immediate relief, I have found it to the advantage of the patient to place the patient in the hospital and put him under opium, one-third grain every hour, for forty-eight hours. That acts on the vasomotor centers, relieves congestion in various parts of the body, and you frequently find that you have not a case to treat—that the stones will pass into the bladder at the end of forty-eight hours. If not, it makes manipulation very much more easy. I do not use morphin, but use one-third opium and keep them under that for forty-eight hours. This makes manipulation very much easier than it would have been otherwise. I do not say that this obtains in some of the very large stones which I have seen here, and upon which I compliment the doctor, but it will greatly assist Nature in relieving vaso-constriction, which is always present in these cases.

Dr. H. W. Walther, New Orleans, La.—I think if Dr. Crowell's paper emphasizes anything today it is the fact that we can not rely much on the size of the stone in the x-ray plate as to whether we can remove it by manipulation or not. I recall that we used to go in and look at the stones in the plate and if they measured a certain thing we would go after them by manipulation, and if beyond that certain size we would resort to surgery. I think Dr. Crowell is to be complimented for his work, and I believe that in all these stones we should make an attempt to remove them via the bladder by instrumentation repeatedly before thinking of surgery.

Dr. W. A. Frontz, Baltimore, Md.—It has been our custom in the majority of cases of ureteral calculus to wait for a considerable length of time before resorting to operative methods for removal. X-rays should be taken from time to time. If there is evidence of descent of the stone, it should be left and the methods of Dr. Crowell resorted to. If, however, there is much ureteral dilatation above the stone, it is a question whether the stone will pass. If there is evidence of increasing obstruction in the kidney, I think it is probably a mistake to temporize by the use of these endo-ureteral methods.

In regard to the use of anesthetics in the ureter, it is my conception that so far as absorption is concerned the ureter is very much like the bladder, and it is a question as to whether the relaxation of the ureter, following the injection of cocain, is due to the specific action of the cocain or to the mechanical effects following the introduction of the solution.

Dr. Raymond Thompson, Charlotte, N. C.—As I have been associated with Dr. Crowell in this work, I would like to emphasize the importance of the systematic use of procain in the urologic tract to secure local anesthesia.

If you expect to obtain local anesthesia from the use of procain in the urethra or bladder, it is necessary to retain the solution from five to ten minutes. The same is true in the ureter. After anesthesia of the ureter is obtained, an effort is made to pass the catheter beyond the stone. When this is accomplished the most difficult part of the cystoscopic manipulative method is over.

Dr. H. A. Fowler, Washington, D. C.—I wish to say just a word or two on this admirable paper of Dr. Crowell's. I think it is very impressive that he has reported such a large series of stones in the ureter successfully treated. It illustrates, or emphasizes, the fact that stones that have once passed into the ureter, in the majority of

cases, will of themselves pass, or can be made to pass, by properly directed instrumentation, and that the patient can be relieved of his disability without a major surgical operation being performed. I have always felt that a stone that is small enough to enter the ureter from the pelvis of the kidneys in the great majority of cases can be made to pass, and Dr. Crowell has proven this to be true in presenting this large series of successful cases.

I would like to ask Dr. Crowell where he gets all these cases, and I should also like to ask what sort of a chestnut it was he referred to.

The question as to what procedure one should adopt when the diagnosis of a stone in the pelvis of the kidney has been made is one that requires considerable experience and considerable surgical judgment. It is a question as to whether or not the stone is too large to pass through the pelvis into the ureter. I think in those borderline cases one is justified in waiting, if the symptoms are not too severe, in the hope that the stone will pass into the ureter, and when it does pass the first constricted portion of the ureter I think we are justified in assuming that, if we can secure the co-operation of the patient, those stones can be made to pass, provided the stone has not produced sufficient damage to the ureter in its descent to produce stricture. Of course, Dr. Crowell is speaking of the cases without such stricture.

I wish to compliment Dr. Crowell upon presenting this series of cases.

Dr. George R. Livermore, Memphis, Tenn.—I think it is a pity that Dr. Crowell's paper has not been heard by the general surgeons. So many patients are given the surgical treatment that might be relieved of their trouble by this more simple procedure.

Another point that has not been mentioned is fulguration, and I have seen a stone drop out into the bladder just after fulguration. It is really astonishing how it will diminish the congestion and remove the stone.

Dr. Lucian H. Landry, New Orleans, La.—In connection with the topic covered by Dr. Crowell's paper, I would like to exhibit a rather unusual specimen. Unusual in two ways—first, because of its size (the stone has the appearance and shape of a large date seed), and second, because it was passed voluntarily by the patient without the aid of a physician or medicine. I did not see the patient until after he had passed the calculus. All I did for him was to talk him out of the stone.

The boy, seventeen years old, gave a very graphic description of the passage of the stone from the ureter to the bladder, where it remained for two or three days before it engaged in the urethra, from where he was able to milk it out.

The smooth surface of the stone explains its voluntary expulsion—we have repeatedly operated and removed stones many times smaller than this one, but they were generally coralliform or mulberry stones.

Dr. A. L. Blesh, Oklahoma City, Okla.—One of the speakers rather threw the challenge to the general surgeon and wished that he might have heard this remarkable paper. I am a general surgeon, and I am also delighted to have heard this paper and learn that stones of the size shown here today can be taken out sans operation. I am glad to know that and to know that it can be done successfully, but as a general surgeon I am questioning as to whether it might be well to tear up the ureter as would be necessary to direct such stones through. Whether or not a clean incision with a clean removal, followed by proper treatment of the affected area, would not be better. The writer's surgical experience has been disastrous, so he says, in the two cases in which he operated. My surgical experience has been entirely the opposite. I have not had any of those bad sequellae—perhaps I am lucky. In one case with a large fibroid tumor of the uretus, gall-stones and stones in both ureters with dilatation of the pelvis. In order to remove the stones I had first to remove the tumor to permit operative approach. Now I have taken out the tumor, the gall-bladder and one of the stones and am letting the patient build up before I take out the other stone. In this case I think we could not have dealt with the stones from below without first removing the fibroid. We had to deal with her as the Dutchman dealt with the dog's tail—cut off an inch at a time because it would hurt too much to remove it all at once. It is a question in my mind whether the repeated manipulation necessary to accomplish removal is not more harmful than the clean surgical procedure. But in the doctor's hands it has evidently bery very successful.

Dr. F. Webb Griffith, Asheville, N. C.—For a long time I have been watching with interest the work of Dr. Crowell. Although I am a general surgeon, I feel that it is wrong for us to operate upon these cases of ureteral stones until such men who have been trained like Dr. Crowell have had an opportunity to see what they can do. We all realize that in removing ureteral stones surgically there is danger of a ureteral fistula, which frequently necessitates nephrectomy. There is seldom any great haste in these cases, so that even if the conservative methods should fail we can then resort to surgery.

Dr. Crowell (closing).—In the first place, I wish to thank the gentlemen for their complimentary discussions. I think it an important subject. I believe, as does Dr. Fowler, that if we will wait sufficiently long in the acutely impacted cases of stone in the ureter many of them will pass spontaneously. However, we can assist in getting rid of the stone and relieve the suffering much quicker by cystoscopic manipulation. Statistics show that about 40 per cent of the cases of impacted stone falling into the hands of the surgeon, the urological as well as general, have been operated upon. Dr. Braasch, of the Mayo Clinic, writes me that 40 per cent of the cases of ureteral stone coming to that clinic are operated upon. This is the lowest precentage of which I am aware. Their cases are probably those of long standing and would be more difficult to remove by cystoscopic manipulation. The majority of our cases have been impacted for quite a while. Most of them come from a distance. They do not grow so rapidly in Charlotte, but we do have quite a run of them. Two cases of ureteral and one of kidney stone came to our clinic the day before we left

home. It is seldom we do not have some of these cases on hand. If Dr. Fowler will stop over on his way home we will be glad to show him some of the patients, pictures and stones, as well as our method of removing them. We have all been overlooking the fact that we can anesthetize the ureters just as we do the urethra. Theoretically, it may be unscientific but practically it works. I have demonstrated time and time again that you can deaden the pain by the use of novocain and pass the catheter above the stone. Suffering can usually be controlled by the use of novocain and morphin while the catheter is being retained. If not the catheter can be removed and the patient given a respite. In the meantime the stone may pass.

We frequently inject hot oil and hot normal saline solution and assist ureteral relaxation in this way.

To remove these stones by surgical operation is a great temptation to any surgeon, but with every precaution you will likely have infection and urinary fistulae. This will certainly be true of the cases where you already have infection of the kidney and ureter. You can do clean work, but the parts are infected and you can't prevent further infection.

I beg of you to give this method a fair trial and I am sure you will sell yourselves—just as we have done ourselves. We believe at least 90 to 95 per cent of these cases can be relieved by this method.

NONUNION OF THE HUMERUS: REPAIR BY MEANS OF THE BONE GRAFT*

By M. S. Henderson, M.D.,
Section on Orthopaedic Surgery, Mayo Clinic,
Rochester, Minn.

Nonunion in the humerus in proportion to the number of fractures sustained by this bone is more frequent than in any other bone in the body. The chief reason for its relatively frequent occurrence is that fixation is particularly difficult to maintain. The patients are ambulatory and the only apparatus ordinarily used that really gives fixation is a spica cast to the shoulder which is not only applied with difficulty, but is unsightly and irksome and cumbersome for the wearer.

This study is based upon the observation and care of forty-one cases of nonunion of the humerus in the Section on Orthopaedic Surgery of the Mayo Clinic. Thirty-four of these patients have been traced. The fact that we performed forty-two operations on these thirty-four patients tells only too clearly why this review was undertaken. From our experience, however, I believe that we have developed a logical operative procedure and aftercare which enables us to deal more successfully with nonunion of the humerus and is worthy of presentation.

Practically all surgeons in America are agreed that the autogenous bone graft offers the best means of inducing union. When bone transplantation was first brought forcibly to our attention, notably by Dr. F. H. Albee, and the late Dr. J. B. Murphy, our hopes were raised high and we expected 100 per cent good results. This has by no means been attained. It therefore behooves us to look into the manner of using the bone graft. The development of transplantation of bone forms an interesting chapter in modern surgery.

Ollier, in 1867, maintained that autogenous bone grafts with the periosteum attached retain their vitality, but that if the periosteum is not attached they promptly die. His claims stood unchallenged until Radzimousky, as the result of experiments, contended that all transplanted autogenous bone dies, but that the periosteum lives and may form bone. Barth, in 1893, went even farther to discredit Ollier's claims, and as the result of experiments said that all the elements of bone die, periosteum, cortex and endosteum. He argued that the bone used is merely a temporary splint and might as well be decalcified or macerated bone, and that all transplants are gradually replaced by bone from the adjacent bone-producing tissue. For some years this theory was accepted, but the clinical results were not in accord with the teachings. Axhausen combated Barth's assertions and as a result of clinical experience and experiments upheld Ollier's theory insofar as the necessity of the presence of periosteum is concerned. In his opinion the greater portion of the graft died and was replaced by new bone by the adjacent bone-producing tissue, by the periosteum, or by the portion of the graft that maintained its vitality. MacEwen, in 1912, claimed that the periosteum is only a lim-

*Read in Section on Orthopedic Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

iting membrane and can be disregarded. Mayer and Wehner claim that the adult bone cell can not form new bone and that the bone-forming properties rest in the osteoblasts of the periosteum, endosteum, and of the Haversion canals. Phemister observed new growth of bone in a graft that had been fractured in spite of the fact that the bone between the fracture and the ends of the bone to which the transplant was attached was dead. This would be against the osteoconductivity theory. In a case which I reported the fracture of a graft in the tibia applied for nonregeneration following osteomyelitis showed abundant callus, but nonunion persisted and a second graft was necessary.[7] Berg and Thalhimer in a very excellent paper state that osteoblasts are the bone-producing cells and are present in small numbers in the Haversian canals beneath the periosteum, but in larger numbers in the endosteum. They believe that the endosteum produces new bone rapidly. The consensus of opinion in the more recent literature seems to be that the periosteum is of aid chiefly in supplying nutrition to the transplant, that the hard cortical bone which consists of adult bone cells has few bone-forming properties and that the endosteum or cancellous tissue is the chief agent in producing new bone.[18] We have all had failures with the transplantation of bone when the operative technic, after care, and so forth had insofar as we knew fulfilled all requirements. In my experience this has been especially true in nonunion of the humerus. If, as stated above, the endosteum or cancellous tissue is the chief bone-forming part of the bone, I believe that we have not applied this knowledge intelligently. A brief consideration of the three ways in which the bone graft has been used in this series of cases serves to emphasize the point I wish to make. Our aim is now to have a surface as extensive as possible of the endosteum of the transplant coapted to the endosteum of the fragments or the part to which it is to be grafted.

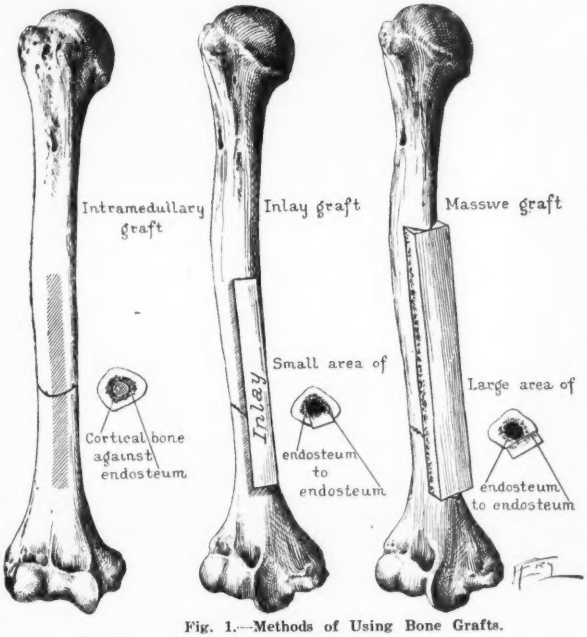

Fig. 1.—Methods of Using Bone Grafts.

Intramedullary Graft.— The intramedullary graft (Fig. 1) advocated by the late J. B. Murphy[13 14] has proved only partially satisfactory and the peg is to be looked on merely as a splint. It is in reality a foreign substance, although cortical bone, and is slowly absorbed, leaving the medullary canal open. Possibly it stimulates to a certain degree the sluggish osteogenetic power of the fragments by bringing bone salts to the part and by increasing the circulation as would any foreign body. There is very little if any contact of endosteum to endosteum.

Inlay Graft.—The inlay graft (Fig. 1) popularized by Albee appeals to one as well nigh mechanical perfection. It has, therefore, been all the more disappointing that the graft has been absorbed gradually or fractured in a certain percentage of our cases. It seems unexplainable. We must remember that the bone-producing cancellous or endosteal layer of the graft is in contact with only a small portion of the same layer in the bone fragments (Fig. 1), and only if the fit of the graft in the

trough is accurate. The too occasional failure of these two methods no doubt has led some, notably Sir Robert Jones, to advocate the so-called step operation. The step operation generally shortens the arm and should be avoided if possible, although the objection is not so strong to such shortening in the arm as in the lower extremity, and in certain obstinate cases it may be best.

Fig. 2.—Massive Graft on the Humerus Held in Place by Beef-bone Screws.

Massive Graft.—For several years we have taken a very large graft from the flat internal surface of the tibia and applied it to the fragments after their periosteum has been removed and the outer portion of the cortex until the cancellous or endosteal layer is exposed. Against this layer, which has strong bone-forming properties, is placed the endosteal surface of the graft. Two or more beef-bone screws are placed through the graft into each fragment, the screws going through the opposite cortex.[9] In this manner a much larger graft than the intramedullary or inlay grafts can be used. The chief advantage is that the bone-producing elements in the graft and in the fragment are in contact over a very large area (Fig. 1). It is my belief that a large part at least of this graft maintains its vitality and becomes one with the fragments. My reasons for this belief are based entirely on clinical experience. Union is brought about much more rapidly than with other grafts and the roentgenogram shows early union of the graft to the fragments.

Even if the belief that the graft maintains its vitality is not correct there still is reason for the use of the massive graft. If the graft is absorbed and replaced by bone from adjoining bone-forming parts the deposition of new bone may be below par in the cases of nonunion, and the absorption of the graft may be faster in comparison than the deposition of new bone. The graft, therefore, should be large enough to act as a splint to the fracture until enough new bone is deposited to support the fragments. The massive graft better than the inlay or intramedullary graft provides this margin of safety.

The records of forty-one patients with nonunion of the humerus were studied. The term nonunion is applied only to the pseudo-arthroses. In this study delayed union is not considered. Many of the forty-one fractures had been compound and thirty had been operated upon elsewhere, not infrequently as often as three times. There were thirty-eight males and three females. The nonunion was on the right side in eighteen patients and on the left in twenty-three. We have heard from thirty-four patients. Twenty-five (73.5 per cent) are known to have obtained bony union, and in nine (26.5 per cent) the operation was a failure. Of the forty-two operations performed on the thirty-four patients traced, twenty-five (59.5 per cent) were successful. Eleven of these patients had musculospiral paralysis at the time of operation. Musculospiral paralysis, in our

experience, is a particularly difficult complication to deal with. Dr. Adson, surgeon in the Section on Neurology of the Mayo Clinic, is inclined to advise in these cases of long-standing musculospiral paralysis a tendon transference of wrist-flexors to the extensors rather than an attempt to suture a nerve with a great loss of its substance. Unfortunately we caused a paralysis of the musculospiral nerve in two of our patients. One we know made a complete recovery in eight months, but concerning the other we only know that the bone is solid.

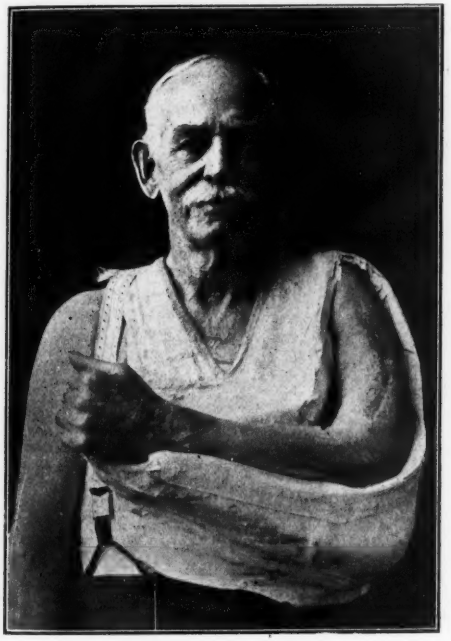

Fig. 3.—Body Cast with Trough for Arm.

In eight of the forty-two operations the intramedullary graft was employed with good results in four (50 per cent); in ten the inlay graft with good results in seven (70 per cent); and in seven the massive graft with good results in six (85 per cent). Thus the bone graft was used in twenty-five operations in the series, with good results in seventeen (68 per cent). The step operation with the beef-bone screws to hold the bone in side-to-side apposition was used in seven cases, with good results in only three (42.8 per cent). In the remaining nine operations various methods were used such as a metal plate, celluloid plate, ivory intramedullary peg, silver wire, and so forth, with good results in 55 per cent.

In the series of forty-two operations, there were five serious infections. These five patients had been operated upon previously and all but one had had infection previously. In the clean cases in which there was not much scar tissue the percentage of infection was exceedingly low, as is usual in bone graft work in a clean nontraumatized field. Therefore, I believe that the percentage of infection (11.90) was no higher than might be expected in this series of cases, and that it can not be attributed to any error in technic. Eight

Fig. 4.—Splint Suitable for Convalescence After Removal of Cast.

cases in which drainage was slight following operation have not been grouped with the infected cases, since healing took place in all in a short time and the convalescence was in no way affected.

Whereas no definite conclusions can be drawn from these small groups representing the different types of grafts the percentage of cures with the massive grafts and the rapidity with which the patients who had the massive grafts recovered function has led me to believe that this graft may possibly maintain its vitality and function.

OPERATION AND POSTOPERATIVE FIXATION WITH CAST AND SPLINT

The incision should be made antero-external and the dissection carried down between the biceps and the brachialus anticus. The musculospiral nerve will then be

entirely out of danger. Naturally, excessive manipulation or too strong retraction must be avoided or the nerve will be sufficiently injured to cause a paralysis. It is best to dissect down onto the fragments through a small incision in the muscles, expose the periosteum and the bone, and then enlarge the incision by working from within outward. There is less danger to vessels and nerves if exposure is obtained in this way. When the fragments are exposed sufficiently above and below the fracture the cortex on one side of the fragments is either chiseled or sawed with the hand saw so that a broad area of the cancellous or endosteal bone is exposed. A large massive graft consisting of all the layers of the bone is then taken from the flat internal surface of the tibia and gently trimmed on the endosteal surface so that it fits the denuded surfaces of the fragments. Care must be taken not to injure unduly the cancellous bone which is very rich in osteoblasts. The graft is held firmly against the fragments with the beef-bone screws (Fig. 2).

Providing adequate fixation following the operation is a real difficulty. We have concluded, after trying various forms of modified aeroplane splints, that the best support is given by the application a few days before the operation of a body cast which has a trough or ledge in which the arm, with the elbow flexed, may be placed at the completion of the operation (Fig. 3). The arm may be held securely by a few strips of plaster of Paris bandage moulded over the arm after it is placed in the trough.

Fig. 5.—Splint Applied.

Fig. 6.—Patient Wearing Coat Over Splint.

If there is no reason to suspect infection the cast is left intact for from four to six weeks, when the top of the trough is removed, the stitches taken out, and a roentgenogram made with extreme care for the arm. It is usually better to leave the arm in the cast for at least eight weeks following the operation when a splint can be applied for the period of convalescence. The splint which we use is very simple (Fig. 4). The base, a piece of cold rolled sheet

steel, is moulded to fit the curve of the thorax and has attached to it webbing straps with buckles. A piece of rolled round edged steel is riveted to this thorax piece, carried up into the axilla, down the arm, the forearm, and onto the hand, and is provided with various semicircular pieces of sheet steel to fit the circumference of the arm. Web straps hold the arm on this frame and the hand and wrist are held in moderate dorsi-flexion. This splint, in addition to being light and comfortable, enables the patient to wear a coat (Figs. 5 and 6) so that his disability attracts very little attention.

CONCLUSIONS

1. The massive graft has been more successful clinically than either the inlay graft of Albee or the intramedullary graft of Murphy.

2. The rapidity of the establishment of solidity with the massive graft has led me to believe that perhaps Ollier's theory that the graft may maintain its vitality and function is correct. Contrary, however, to Ollier's theory, I believe this is not due to the periosteal layer, but to the firm contact of the endosteal layer of the graft with the endosteal layer of the bone to which it is transplanted.

3. A body cast with a trough for the arm applied a few days before operation provides the best postoperative fixation that we have been able to provide.

4. A splint should be worn during the period of convalescence after the removal of the cast. The time at which this can be substituted for the cast differs in each case and should be decided on clinical evidence and roentgen-ray examination.

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DISCUSSION

Dr. J. Spencer Davis, Dallas, Tex.—I had the privilege of being associated with Colonel Albee in General Hospital No. 3. There we saw some failures of bone grafts done elsewhere, and we were interested in trying to ascertain some of the reasons why individuals had failures in getting bony union, and we formed some opinions about it.

The first instructions which were sent out by the Surgeon-General's office described the technic for operations, stating that the skin should be sewn with nonabsorbable material. Colonel Albee felt that this is a mistake, for the reason that if you sew the skin with nonabsorbable material you must open the cast along about the tenth day, at a time when the graft is beginning to take. If you allow the least bit of motion at this time you break down the vessels that are beginning to grow into the graft, and that is responsible for one source of failure.

Another mistake we found was men were using too short a graft, that is, they would attempt to repair a defect in the humerus with a graft of an inch or two long. Many times it did not contain any medullary portion. It is quite important that you get some medullary portion and bring this part in contact with the medullary portion of the fragments.

Another point we found to be a source of failure many times was incomplete fixation. Many times men did not fix completely the joint above and below. We uniformly used a plaster cast and absorbable suture material for the skin, and unless there was a rise of temperature or something which would occasion going in, we did not disturb our cases at all.

In dealing with these war cases we found some of them were operated too early or without proper preparation. After the wound had been healed for a period of two months these cases were put in a special ward set apart for them and the individual had his apparatus which he had been wearing removed. We did our manipulation once to see whether there was a rise of temperature or leukocyte count which would demonstrate that the old latent infection had not been entirely stamped out.

I saw recently in one of the medical journals a report of a series of cases where a man did a

bone graft of the forearm. After he looked up the x-ray pictures in this case it was found the graft had been undertaken without correction of the deformity. The radius had markedly deviated to the ulnar side, and when the surgeon did the operation and inserted the graft, the graft was put in under stress. If it is put in under stress it may hold for a time, but as soon as absorption takes place the pull and tension of the muscles will cause the graft to become slightly dislodged. An accurate fit helps a great deal, in that it prevents extravasation of blood after the operation. If the graft fits accurately, there will not be as much extravasation of blood, and that may be a cause of some of the failures.

Dr. W. Russell MacAusland, Boston, Mass.—I would like to ask Dr. Henderson as to the possible causes of infection in these cases. I believe he stated in his series that he had 12 per cent infection. I can not believe that the individual technic alone accounts for this percentage of sepsis following bone graft work.

I also note that Dr. Henderson has used bone screws. I think most of us who have done fracture surgery have found that the introduction of screws through holes in bone, whether by metallic substance or beef bone, does definitely delay union, and there is an old teaching that metal in contact with bone sooner or later causes suppuration. I would like to ask Dr. Henderson whether the introduction of bone screws had anything to do with the infection. Screws in bone loosen up quickly. They do not hold tightly, and I wonder whether in some manner absorbable material could be applied around the graft and humerus to improve the technic.

Dr. William S. Baer, Baltimore, Md.—I am sure we are all very much interested in Dr. Henderson's analysis of cases in which grafts were used. I did not understand in the massive graft whether periosteum was left on the graft or not. If you believe it is endosteal bone, why do you leave periosteum on?

In regard to the point made by Dr. Davis relative to the request made by the War Office to sew wounds with nonabsorbable suture material, we have been using in our hospitals for many years nonabsorbable skin suture of subcutaneous wire, it having been instituted many years ago by Dr. Halstead. The suture does not go through the skin at all, but through the subcutaneous layer and remains in the subcutaneous layer for six weeks or two or three months, so that the wound does not have to be disturbed at all, and you have a nonabsorbable material which does not permeate the hair follicles, and it is satisfactory in that way.

Dr. Charles C. Garr, Lexington, Ky.—I would like to ask the essayist what percentage of syphilis he finds in cases of nonunion.

I am very much interested in that phase of the subject for the reason that recently I have had two cases in the humerus and one of the tibia, in which I used intermedullary grafts in one and the inlay graft in the other, and there was nonunion. In both cases the x-ray findings showed a correct position and the Wassermann was negative. But in giving a provocative dose of neosalvarsan I was able to produce a three plus Wassermann. Giving no other treatment except syphilitic treatment, I got perfect union.

Dr. Henderson did not take up the causes of nonunion, and I would like to know whether in making routine Wassermanns what percentage he finds in nonunion of bone.

Dr. Henderson (closing).—With reference to the suture material brought up by Dr. Davis, I do not believe it has the importance that he seems to attach to it. We put in nonabsorbable sutures of silkworm gut and dermal sutures and leave them in three or four or six weeks without producing any irritation of the skin.

The doctor also mentioned the causes of failure in bone grafts. He may be right in his criticism of cases he has seen, but even in spite of the best technic, where you have a large inlay graft and there is perfect asepsis and no trouble whatsoever, occasionally nonunion persists. That is the reason I emphasized the use of a large massive graft which I think is preferable to the inlay or intramedullary graft. In the tibia it is not very applicable, and I do not think it is as necessary there as it is in the forearm. In the humerus and in the femur I am sure it gives a higher percentage of successful results than the inlay.

In regard to the use of bone screws, Dr. MacAusland asked whether there is any objection to boring holes. I do think there is an objection if you use metal, but there is no objection to the use of beef bone. In some cases of nonunion we have used beef bone plates and have gotten excellent results.

Dr. Baer asked whether we included all the layers of bone in the graft. We take all layers of the bone. The periosteum is not very important, but it has something to do with the nutrition of bone.

Dr. Garr mentioned the question of syphilis. In all these cases Wassermanns were taken. We make it a routine to take Wassermanns on all fracture cases. While our material is a little different from that in large cities, it is drawn from all over the country and it is fairly typical of what you see in most clinics. I have not seen a case of nonunion due to syphilis. The only suspicious case was that of a woman, 50 years of age, who had a fracture. She presented a picture of what one might call a cystic degeneration of the bone and we were in doubt whether syphilis had anything to do with the fracture or not. Under treatment she improved, but the last time I heard from her there was no union. I feel that syphilis in its relation to nonunion of fractures plays an unimportant role.

PRENATAL SUPERVISION*

By Quitman U. Newell, M.D.,
St. Louis, Mo.

I present this paper before this Section with the expectation of arousing some discussion. Prenatal Supervision in the rural community is a problem we are all trying to solve. It has already been worked out in part in our larger cities and we are getting excellent results. The eyes of the profession are now turned to the rural districts.

The Children's Bureau of the United States Department of Labor, of which Julia C. Lathrop is chief, is doing wonderful work along this line. Several publications are in circulation dealing with maternity care and welfare of young children both in larger cities and in rural communities. Never before in the history of the world has the vital importance of adequate prenatal care, together with conscientious obstetrics, been so generally realized as at the present time. In New York, Boston, Chicago and St. Louis before the World War some work was being done in the interest of the expectant mother, but since the war these efforts have received a tremendous impetus, for which we all should be thankful.

In 1913 in this country at least 15,000 women (and this is an underestimate) died from childbirth. About 7,000 of them died from puerperal infection, a disease almost entirely preventable, and the remaining 8,000 from conditions common to pregnancy and labor, that are to a great extent preventable. In 1913 childbirth caused more deaths among women fifteen to forty-four years of age than any disease except tuberculosis. Likewise, it is shown that the greatest percentage of babies who die in the first year of life do not live to be one month old. This must mean two things: First, lack of prenatal care, and second, incompetent management of labor and the new born baby.

Nine-tenths of all expectant mothers receive no prenatal care. Over forty per cent. are attended in labor by midwives and physicians who are unqualified and incompetent to supervise the pregnant woman. Many thousands die of puerperal infection because they do not have proper attention. Others are incapacitated for duty and become more or less complete invalids because of the same lack. Thousands of children are still born, due to failure of diagnosis of the position of the child, or of the size of the mother's pelvis. Often when instruments are applied and the baby is dragged out by mere force its skull is crushed and injuries are caused that impair its mentality and leave it a subject for the public institutions. Thousands of pregnancies come to an untimely end because the expectant mother has not had the necessary and proper guidance. How can this deplorable condition be corrected? First, by education of the laity to demand better care and to demand that their baby shall be born perfect. Second, better education of our young doctors in matters obstetrical.

Several years ago the Women's Municipal League of Boston undertook to circulate propaganda relating to prenatal care, and much good was accomplished both among the laity and the medical profession. Their work was quickly taken up by many other organizations, and the field is now becoming full of prenatal workers, especially in the cities. Some counties in various states have undertaken the work, and it promises to spread to other states. We hope it is only a matter of a short time before every community is provided with prenatal care under municipal or state supervision. Why should not this problem be handled by our government? Our government is made up of the brains of the country, and we must have the best thought and work on these problems. We know in order to get the best results we must begin our care with the unborn baby. When our country needed us for the World War they simply told us to come along and go to war. They took complete control of us and expected the best we had in us. Then, why should not our country supervise our unborn children? It would be fairly easy to place bureaus in each county or district and have available nurses and doctors who would freely advise all pregnant women. As soon as a woman knows she is pregnant she should register with the bureau, or better still, her physician should register for her. It seems to me

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that in this way we could maintain an efficient service for the rural mothers.

Questions then of the most vital intrest to the whole nation are these: First, how are the lives of the mothers in this country and in other countries being protected? Second, to what degree are the deaths caused by pregnancy and childbirth preventable? Third, if preventable, are we doing our part? Fourth, has there been the same great decrease in the last few years in sickness due to childbirth as there has been in other preventable diseases, as typhoid, tuberculosis and diphtheria?

MIDWIVES

The cry is often raised to abolish the midwives. Those who raise that cry forget what statistics show in comparing midwives with poorly trained doctors. The Children's Bureau of the United States Department of Labor has just published a report, "Maternity and Infant Care in Two Rural Counties in Wisconsin." One county was selected from the northern part of the state where the population is composed of foreign elements, mostly German and Polish, and the majority of women are delivered by midwives. And one county in the southern part of the state where physicians are in attendance, with practically no midwives.

In the northern coutny the infant mortality was low compared with the average for the United States birth registration area. The stillbirth rate was somewhat higher than the rate found for six of the eight cities in which infant mortality studies have been made by the bureau. The death rate of mothers from causes connected with childbirth was high. In the southern county the infant mortality rate was higher than in the northern county, but the stillbirth rate was lower. Only one mother died at childbirth. In neither of these counties did any of the patients receive either prenatal or postnatal care. The question then arises, shall we abolish the midwife completely and allow the poorly trained physician to continue his unscrupulous practice when he in reality is no better than the midwife? Do not misunderstand me. I am not making a plea for the midwife, because I personally think there is no place for her in the medical field. Rather, on the other hand, I wish to awaken the medical profession to the importance of good obstetrical care and thus put an end to the great mortality due to poor obstetrics.

Some states have fairly good laws in supervising the midwives, but rarely do they enforce these laws. They are required to pass the same obstetrical examination as the physician and are then licensed. Other states, without examination, require a small registration fee, and then issue a license to practice midwifery. In many rural districts there are midwives who never register, but go about delivering babies without even a knowledge of reading and writing. Especially is this true of many of our Southern darkies. Before we can decrease the mortality of mothers and babies, this sort of practice must be stopped. The solution is fairly simple in the larger cities. The schools of midwifery in this country are diminishing, and the midwife that now exists will in a few years seek other employment. The out clinics which are now being conducted in the larger cities offer free care to the pregnant woman and in complicated cases free hospital care, which is drawing the clientele from the midwife. In the rural communities, with better education of the laity and with better teaching and training of the young physicians at our medical schools, we hope eventually to decrease this high mortality of mother and baby.

PUERPERAL INFECTION

Dr. Grace Meigs, of the Department of Labor of the United States of America, in a report shows that during the twenty-three years ending in 1913 no definite decrease in the death rate of childbearing can be demonstrated in the death registration area of the United States. It is further shown from a study of the death rates of fifteen foreign countries that only five of them, England and Wales, Ireland, Japan, New Zealand and Switzerland, have effected any diminution in the mortality of childbearing in recent years, and of these England and Wales and Ireland are the only countries which show a falling off in percentage of deaths due to puerperal sepsis. One might think that from the days of Lister's discovery maternal deaths from puerperal infection would be greatly decreased. Statistics show that the same per-

centage of mothers are dying now as then, and that in the rural communities and in cities without maternity hospitals the percentage remain the same. It is true in our well regulated hospitals we do not have the epidemics of puerperal infection that we had in days before surgical asepsis was developed. But outside of well managed lying-in hospitals the mortality and morbidity in connection with childbirth is disgracefully high.

In the year 1860 the death rate from puerperal sepsis was returned at 1.4 per 1,000 births and in 1913 it was 1.3 per 1,000 births. Apparently we have not improved over the pre-Listeran days. What is the reason? Simply that we are not observing asepsis in our technique. In our well regulated lying-in hospitals, where technique is good, we do not any longer see epidemics of puerperal infection. At times a sporadic case is present, which usually can be traced to an outside physician or midwife. The patient entered the hospital already infected. But we must remember that only a very small percentage of women receive hospital attention, and we must deal with the problem in general.

Taking the conduct of labor in general, not much more than an antiseptic solution stands between the practice of today and the practice of pre-Listeran days. This is not what Lister founded, though it has been misconceived my many physicians. When rubber gloves came into popularity the obstetricians thought the matter was solved and resorted to placing his gloves on his hands after using the antiseptic solution and proceeded to make his delivery. This is not the great founder's theory. He laid down principles dealing with asepsis pertaining both to operator and patient. Why do we as obstetricians not follow this teaching? It has been proved that millions of bacteria make their home on the vulva, especially the labia minora and around the margin of the anus. If we do not prepare our field of delivery according to aseptic technique when we attempt to examine the patient we carry infecting organisms into the vaginal tract. We should be able to prevent extrinsic infections by careful preparation of our patient with antiseptics and wearing of rubber gloves. Besides the immediate loss by death of a number of child-bearing women each year we must consider the number infected who do not die, but are left sterile in one way or another, and thus shut off from the possibility of childbearing. By a comparative estimate I believe that out of every five patients seriously ill of puerperal infections one dies and four get well, but are left afflicted in some way, usually by sterility. This morbidity is very injurious to the nation. Most of these women are unfit for their daily duties; others are sterile or are afraid to bear children, and lastly a good proportion of the children die because they are taken away from the breast.

TOXEMIA

The second most common cause of disaster to pregnant women is toxemia, which is classified as follows: (a) pernicious vomiting, (b) acute yellow atrophy, (c) preeclampsia toxemia, (d) nephritic toxemia. This deals directly with the unborn child and is the foundation for prenatal care. Toxemia when properly handled rarely ends with untoward results. Most of these cases we classify as disturbances of metabolism, and treat by diet, attention to elimination, hygiene, etc. In rural communities and incities where midwives are in attendance and the patient has no prenatal supervision, the mortality of both mother and baby are high. In a well regulated clinic, where all patients are under a direct prenatal care, the outcome is usually good.

We must educate our patient to report to her physicians as soon as she knows herself to be pregnant. This is fairly easy in the larger cities, but in the rural communities the physicians seldom sees his patient until she is in labor, when he is called and meets the condition confronting him. This is the problem we must solve. We need a better co-operation of patient and doctor.

At preliminary examination the patient should have a very careful general examination. Especial attention should be paid to the heart, lungs, kidneys, breasts, blood pressure and pelvis. Determine that the ovum is intra and not extra-uterine. Measure the pelvis very carefully externally and internally. Take a Wassermann of the blood and keep accurate records. Give your patient prenatal advice, or better still, have some pamphlets printed stating facts in detail. Have the patient report to you

monthly and bring a specimen of urine for the first six months. After that time let her either bring or send you speciment of urine every two weks. During the last four weeks of her pregnancy she should have a very careful examination to determine the presentation and position of the child. Estimate the size of the child and see if the presenting part is in the pelvis. At this time make another very careful measurement of the pelvis and give her instructions to call you at the onset of labor.

At the Washington University Obstetrical Service, which has been run for years, we are doing a great deal of prenatal work. Dr. Henry Schwarz, professor of obstetrics and gynecology, several years ago realized that an obstetrical service cannot be complete without competent prenatal, natal and postnatal care, and in 1914 read a most excellent article on "Prenatal Care" and outlined the working of such a service. Today we feel that we are running one of the best obstetrical clinics in the country. Our results are most satisfactory, and we feel we are going ahead in the development of our nation by giving children prenatal care.

DISCUSSION

Dr. George Clark Mosher, Kansas City, Mo.—The paper of Dr. Newell brings out a great many valuable points regarding this most interesting subject, which now occupies a prominent place in our obstetric forum.

When we consider the report of the Bureau of Child Welfare, at Washington, and realize that in five rural communities in various parts of the country that out of one hundred and sixty-nine births only ninety-seven children survive and then take the statistics of Lea that in England in forty years the morbidity and mortality of women in child birth has only been reduced the fraction of 1 per cent, the crying need of prenatal care becomes insistent.

We must engage in a propaganda to induce municipal supervision of prospective mothers, through child welfare centers, prenatal clinics and parent-teacher associations.

Our doctors can be aroused by an appeal to give their patients advice and care during this critical period.

The Boston Association for Mothers' Welfare has published remarkable results of its work. In Kansas City we have organized under the auspices of the Junior League a prenatal clinic and another will be arranged early in January.

Individuals as well as obstetric societies can help to improve the conditions which have prevailed.

I want again to thank Dr. Newell for his timely paper.

Dr. W. H. Vogt, St. Louis, Mo.—The paper of Dr. Newell brought out some very interesting points in this very important subject, and I feel that prenatal care should receive still more attention than has been given to it in former years. The essayist spoke of the practices of the midwife and what little prenatal care they give their patients. I am sure all of what he says is true, but I do not believe that the average doctor gives his patients much more care. The trouble lies with the education of the medical student. The obstetric course given the students is far from being sufficient. The student, after having seen a few obstetric cases, and having had only a limited number of didactic lectures, is graduated and goes out to practice obstetrics. He does obstetric work not because he likes it or because he knows anything about it, but simply as an introduction to the family, hoping thereby to eventually get the family practice. He makes no effort to improve his knowledge of the subject, but his main object is later to get to treat the baby that he has brought into the world, the mother, the father, in fact to treat any member of the family of whatever ailment may arise.

The average doctor practices more obstetrics and knows less about it than perhaps any other subject in medicine. They wouldn't think of taking care of a serious eye trouble for fear of the patient losing an eye, yet he doesn't hesitate to take chances with the life of a mother and baby.

I am not criticising the doctors, but I think the fault lies with our methods of teaching and not until these are improved and the student impressed with the need of a good obstetric foundation will the women in labor receive the care that she has a right to expect.

Dr. R. E. Wobus, St. Louis, Mo.—As Dr. Vogt has pointed out, the best thing the "prenatal movement" will accomplish is the fact that it will teach women to demand better obstetric service. Dr. Newell speaks of the deplorable condition in the rural community. We may as well admit that, outside of the maternity clinics and hospitals, conditions on the whole are no better right in St. Louis. Some years ago, in looking up this matter, it was found that, while about 60 per cent of the women in St. Louis were delivered by midwives, there was a greater maternal morbidity and mortality in the 40 per cent delivered by doctors. This is explained by the fact that the physician more often comes in contact with contagion and more often employs operative procedures to terminate labor. This ratio has changed somewhat. The midwife is on the wane and, so far as I know, there is at present only one midwife school in the United States, the one connected with Bellevieu.

We are getting, in late years, doctors who are better trained in obstetrics, yet I am quite certain that not one-half of the doctors in St. Louis own a pelvimeter and doubt if more than one-half of them examine the urine of their pregnant women. These things will change when the patient herself knows what she has a right to expect.

In the cities, at present, the well-to-do and the very poor receive the best obstetric care, both classes being taken care of in hospitals and maternity clinics. The wife of the man who is too

poor to go to a pay hospital and too proud to take advantage of a charity clinic receives, on the whole, the poorest obstetrical service. One of the greatest handicaps has been the lack of nurses to take care of this class of patients. They can not afford the services of a trained nurse or two, and many of the so-called "practical nurses" are not only incompetent but positively dangerous. Fortunately, the St. Louis Maternity has already taken steps to alleviate this deficiency by establishing a one-year course of training for obstetric attendants who, while not at par with the trained nurse, will be vastly superior to the untrained and unpractical nurse.

Dr. C. R. Hannah, Dallas, Tex.—The subject matter of this sort is extremely important and very appropriate in opening the first Section on Obstetrics by the Southern Medical Association. I certainly commend the theme of Dr. Newell and heartily agree that improvement in obstetrics can be brought about largely by intensive teaching in the medical schools and carrying a knowledge of obstetrics and its danger to the public.

Personally, I think that every woman ought to be under the supervision of an obstetrician from the time that she realizes that she is pregnant until she is delivered and prepared to be returned to the gynecologist, if necessary.

I believe that when she has engaged her obstetrician he should make her a pupil and teach her the important points that might lead to complications. There is no reason why our patient should not have a knowledge of the pre-eclamptic symptoms. Information on this subject will certainly act as a prophylactic. There is no reason why she should not have a knowledge of infection, for she readily then will co-operate. There is no reason why she should not have a knowledge of the growth of the fetus, for a knowledge on this subject will certainly teach her to exercise greater care in health in preparation for delivery. I am confident that eclampsia can be prevented and the biggest asset in the prevention is for the patient to have a knowledge of eclampsia and of the pre-eclamptic symptoms upon which she may act and exercise her judgment in cooperation with the obstetrician. If the obstetrician is negligent or careless, she and the public pay the price. Teach our patients that complications in obstetrics become a liability to the family rather than an asset.

Let us again commend Dr. Newell for bringing this subject to our attention and let each of us take an invoice of ourselves and find just in what particular we are derelict.

Dr. M. Pierce Rucker, Richmond, Va.—I am very glad of an opportunity of hearing Dr. Newell, as I have been reading the theses from Dr. Schwartz's clinic with a great deal of pleasure. The problem, as Dr. Newell rightly states, is the same as other problems in preventive medicine, i. e., education (1) of the medical student, (2) of the public. That we are not properly educating the medical student is shown by such statistics as those published by Levy, of Newark, N. J., several years ago, in which he showed that the mortality in cases handled by midwives and those handled by physicians is practically the same. Of course he was careful to charge back to the midwives those cases that began under their care.

When we look at the question from a different angle, what more can we expect when we turn out practitioners of obstetrics with so little practical experience? In Richmond, for instance, we require the student to attend twenty cases. Most of these, of course, are normal cases, and many of them have already delivered themselves when the student arrives. With this experience he goes up into the mountain or out into the country and is confronted with the most terrible emergencies that can confront a practitioner in any branch of medicine. In medicine or surgery he has time to get assistance or to get his patient to a medical center, but in obstetrics this is impossible, and he has to solve his difficulties unaided. How to get the medical schools to give a better course in obstetrics is, I confess, a hopeless problem.

The second kind of education, that of educating the public, is much easier. With a well organized prenatal clinic and a corps of tactful, enthusiastic nurses, it is easy to get in touch with the public. The nurses get the patients to come and keep them coming and the patients absorb unconsciously a great deal about what good obstetrics means. It is quite possible that some time in the future they will insist upon better medical education in this line.

In regard to infection, I think in stressing proper preparation of the hands and the external genitalia, we are apt to overlook the patient's resistance. It matters not how clean and thorough we may be, we can not render the upper genital tract sterile. Dr. Reed, of Chicago, in his work on induction of labor at term, made cultures in all of his cases and found all manner of pathogenic germs, streptococci, staphylococci and gonococci on the cervix. Now, if we permit the patient to have a long exhausting labor and thus lower her resistance to infection, we are apt to get a case of sepsis in spite of the most rigid technic.

Dr. Newell (closing).—I am very well pleased to hear such an interesting discussion on this important subject. It is very convincing to me, after seeing such great enthusiasm, that we are awakening to the fact that good obstetrics is being demanded by the public and that it is not far distant before we will accomplish more in the development of the human race. Prenatal supervision is absolutely essential and the discussion before this meeting has demonstrated that it is already beginning to reach into the rural communities and that it is only a matter of time until it will become universal.

EYE, EAR, NOSE AND THROAT

UNRECOGNIZED GLAUCOMA AND THE GENERAL PRACTITIONER'S RESPONSIBILITY IN ITS DIAGNOSIS*

By Hiram Woods, M.D.,
Baltimore, Md.

SUMMARY

Attention is called in the paper to some details in the development of glaucoma which the physician should know. They are:

1. The significance of frequent changes in glasses in persons over 50, especially in the direction of seeming myopia. Dangers of the optometry examination.

2. Misleading influence of the term "incipient cataract" for "lens striations." The latter often do not advance. If they do, *uncomplicated* progress is painless, and pain or injection means something else. The cloudy appearance of the lens in glaucoma may be mistaken for cataract unless the ophthalmoscope is used.

3. The pain in progressive glaucoma is unlike that of eye strain. Often thought to be neuralgic or rheumatic. These troubles are now known to be usually due to an infection focus. Importance of search for it.

4. Gastric disorders frequent in progressing glaucoma. Importance of recognizing the direction of cause and effect.

5. Recognition of the ocular injection of glaucoma as distinguished from that of conjunctival. A physician should know the differential diagnosis of conjunctivitis, keratitis, iritis and glaucoma or else let every red eye alone.

The theme of this paper was assigned by our Chairman. When we met in New Orleans in April, he put his request somewhat as follows: "The general practitioner in the South regularly reads the special papers appearing in the JOURNAL of the Southern Medical Association. We ought to take advantage of this by writing on eye diagnosis. Won't you bring to Louisville a paper upon glaucoma based on observed errors of diagnosis? Such a paper should point out to the ophthalmologist the lines along which he should try to enlighten his professional associates and would, at the same time, be generally read by physicians."

In complying as well as I can with Dr. Stucky's request, I shall be compelled to review certain things entirely familiar to all my hearers.

When ocular hypertension occurs because of a previous or existing eye disease, the intelligent practitioner will naturally seek advice. In primary glaucoma, early eye symptoms may not be noticed unless looked for. The problem is one of interpretation. Not always, even when things turn out badly, can the physician be justly blamed, for the early eye symptoms may be so trival in the patient's opinion that no special stress is laid on them. Extra-ocular signs may be wanting. But when the latter are present the doctor should be prepared to properly interpret them. He should know when an eye examination is needed. The physician's responsibility to glaucoma is thus expressed by Fuchs:

"Primary glaucoma is a common disease, constituting about 1 per cent of all cases of eye disease. Its accurate recognition is of the greatest importance for the general practitioner, the more so because here prompt and proper therapeutic interference can save everything, but a false diagnosis and improper treatment may destroy everything. Unfortunately, we still constantly get under observation many cases of glaucoma which have been incorrectly diagnosticated by the general practitioner, and which come to the ophthalmologist only when help is no longer possible. Cases of inflammatory glaucoma are often confounded with iritis or iridocyclitis and are accordingly treated with atropin, which has a particularly deleterious action in glaucoma. Cases of glaucoma simplex which present no external symptoms of inflammation are not infrequently regarded as commencing cataract, and the patients are put off in expectation of the cataract's becoming ripe, so that they delay until it is too late for iridectomy."

We may accept the following as established: In glaucoma harm comes to the eye from increased intra-ocular pressure. When the hypertension is intermittent and slight, the eye may remain free from congestion and visual symptoms be transient and of slow progress. This is chronic or simple glaucoma. Again, if the eye possesses a "glaucomatous tendency," as it is called, sudden hypertension may develop with injection, i. e., evidence of eye inflammation or inflammatory glaucoma. In a third class the onset of hypertension may be so sudden as to overwhelm the eye. This is fulminating glaucoma. The two

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latter forms demand prompt operative interference. Let us consider the symptoms of the first and second of these forms.

CHRONIC GLAUCOMA

It presents no signs of inflammation. Indeed the diagnosis often escapes the oculist unless he forces himself to follow a definite routine. There may be temporary obscurations of vision; apparently, frequent need for changing of glasses (often in the direction of myopia and diminishing presbyopia until visual acuity lessens and then a magnifying glass may be selected). Sometimes there are haloes about artificial lights; tension may be slightly increased to the fingers or the tonometer. However, with these visual symptoms one frequently will not discover elevation of tension. It is in studying field vision that one makes the diagnosis. Contraction, especially on the nasal side, or scotomata, with certain definite features plus the gradual glaucomatous cupping of the optic disc, give the diagnosis. It must be admitted that these things concern the oculist alone and that the general practitioner would be apt to inquire about them only if previous observation had shown him the association between a slowly developing and destructive eye disease and certain symptoms easily under-estimated. But these refraction changes present features which the physician should appreciate. At this time, when that pseudo-scientist called the optometrist is so prominent, the medical adviser should be put on his guard. *The fact that a patient of fifty years or more requires frequent changes of glasses is of itself a matter of grave suspicion provided refraction work is correctly done in the first place.*

The refractive changes in chronic glaucoma are thought to be due to one of two influences: (1) lowering of accommodation due to hypertension with consequent increase in presbyopia, and (2) swelling of the lens with just the opposite effect on refraction, i. e., increase in refraction with apparent myopia and lessening of presbyopia. This latter may be the precursor of peripheral lens striations which can easily escape notice. Every case of so-called incipient cataract should be carefully watched from this standpoint. The hypertension in such a case may be regarded as secondary to the lens swelling, thus making the glaucoma technically secondary. However, this fact does not interfere with the point under consideration, namely, that apparently progressive myopia in an individual over 50 (so called second sight) may lead to glaucomatous changes due to lens swelling. The following case illustrates:

Some years ago a lady of 58 consulted me about an increasing myopia for which an optometrist had, every few months, ordered concave glasses of increasing strength. He strengthened the glasses as long as he could give satisfactory vision. When he was unable to do this, he told her she was developing "second sight," the forerunner of cataract. Minus 8 sph. gave her 20/70, her field was limited to 10°, tension +1 to the fingers (it was before the days of the tonometer), and there was typical glaucomatous pitting. Under treatment with miotics, the case was kept under control during the rest of her life, three or four years. Better vision probably could have been preserved by an earlier diagnosis.

Here was a patient who, under the advice of her physician, accepted the diagnosis of an optometrist, or optician as he was then called, because the aforesaid optician had properly corrected the doctor's own presbyopia. The characteristic greenish appearance of the glaucomatous pupil had finally led to the diagnosis of cataract. The patient was waiting for its maturity. This case illustrates not only the possible evils of optometry, but, with the following case, emphasizes a real danger hanging over persons with so-called incipient cataract:

The late Dr. Russell Murdoch, of Baltimore, who was one of the most careful diagnosticians I ever knew, found in a lady's eye peripheral lens opacities. Her central vision was normal. He told her of these lens cloudings and warned her to come for periodic examinations. She stopped after a time, and after Dr. Murdoch's death came into my hands. One day, six months after the last previous examination, she consulted me because of an acutely congested eye, dilated pupil and pain. She told me that these symptoms had developed two or three months previously; that she had not been to see me because she was sure it was only the development of the cataract and she wanted to know if it was ready for operation. She had sub-acute glaucoma and an iridectomy saved the vision that was left, about 20/50, with contracted field. The so-called incipient cataracts never ripened, but they misled. Often they do not mature.

This case, considered with the other, presents two very important truths. Even if peripheral lens opacities are found, the term "incipient cataract" is a misnomer.

It gives the patient mental torture and, worse still, makes him take a wrong view of his entire eye condition. In my judgment the term "incipient cataract" should be left out of our nomenclature. If, however, the lens opacities are mentioned at all (and undoubtedly they should be to some member of the family) there should be added and forced home the statement that "ripening" cataracts do not give pain and that when pain or congestion come, something else is indicated. Prior to this experience I had not made it a habit to give this warning to patients with lens cloudings. Now I invariably do. I tell the patient or some one in the family that there is no reason why an eye with lens cloudings should not develop something

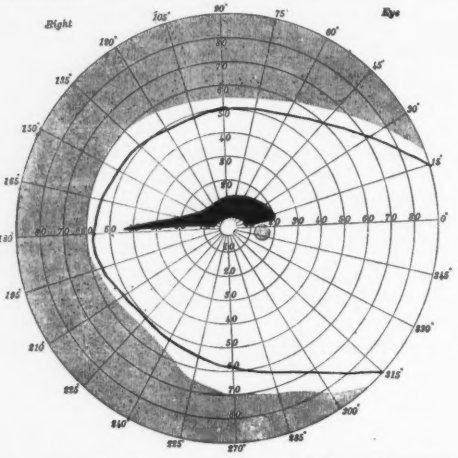

Fig. 1.—Glaucomatous scotoma discovered in routine examination. No previous suspicion of disease.

else; that regular inspections are necessary and that if pain comes, it may be very significant. This is another line along which our general practitioners should be instructed. The word "cataract" should not be used till it is known that the opacities are progressive.

Apart from visual changes, there are symptoms during the progress of glaucoma which might readily take the patient to his physician.

I want to discuss one—pain. The neuralgic pains of glaucoma may vary from a mysterious sense of discomfort and tension in reading to severe pain of a perfectly characteristic nature. The two patients whose fields are herewith presented illustrate the first class. One had and still has, by refraction correction, normal central vision. But there is a paracentral scotoma starting from the normal blind spot, passing above the fovea and over into the nasal field (Bjerrum's symtom). (Fig. 1). The other patient had no idea that his eyes were involved. I saw the case in consultation with my friend, Dr. L. F. Barker, who had been consulted for unexplained gastric disturbances with severe attacks of neuralgic head pains. A similarly situated scotoma was found. (Fig. 2). Both of these patients presented cupping of the discs. Had the physicians who saw these cases before they reached Baltimore realized the importance of these neuralgic pains, valua-

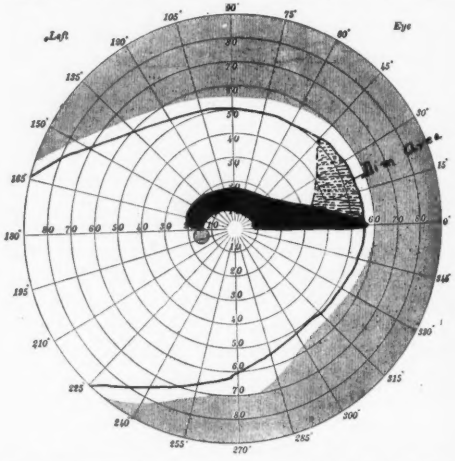

Fig. 2.—Glaucomatous scotoma discovered in routine examination. No previous suspicion of disease.

ble time might have been saved. But in each case the "neuralgia" had been confounded with the headache of ametropia. There is a vast difference between the constant band-like supraorbital pains of eye strain and the periodic boring eye or temporal pains of glaucoma. Either might be called "neuralgia" by the patient and would naturally take him to his physician. He should be able to distinguish between the two classes of pain, or ought, at least, to know that such symptoms demand eye study by a trained ophthalmologist.

Passing allusion must be made to another easy and wrong diagnosis. For many years, and to a certain extent even

now, rheumatism or a "rheumatic tendency" has been accepted as an explanation for various sensory disturbances. In most of our text books there is description of "rheumatic" eye diseases. Inflammatory glaucoma was once called "ophthalmia arthritica." Chronic glaucoma has often been thought rheumatic because of the occurrence of muscular pains, etc., during its course. Consider this for a moment in the light of what we now know about rheumatism and neuralgia. We may at the same time consider arterio-sclerosis, based on the feeling of radial resistance. Neuralgia, rheumatism and beginning arterio-sclerosis are sometimes necessary, but always insufficient diagnosis. All have a cause. Focal infection is now recognized as a frequent producer of just these things. When we speak of chronic primary glaucoma we mean an eye going blind with moderate hypertension, slow development of the glaucomatous cup and nerve atrophy, accompanied, more or less irregularly, by other symptoms, with fundamental cause unknown. May it not be possible that a focal infection can produce temporal neuralgia and intermittent ocular hypertension of low degree just as we know it sometimes produced choroiditis with secondary hypertension; the same process but of less severity and acting on the neuro-retinal rather than on the uveal circulation? In other words, I suspect that sometimes our inadequate and unsatisfactory explanation for chronic simple glaucoma may be displaced by better knowledge of the effects of focal infection. Be this as it may, the lesson for us is plain and it should be passed along to the internist. These sensory and vascular disturbances ought to be studied from the standpoint of focal infection. Whether the symptom be neuralgic, rheumatic or hypertonic, search for an infection-focus or peripheral irritant will necessarily involve the sinuses and eyes. Thus, study of remote disorders may reveal an unsuspected glaucoma. The case seen for Dr. Barker in a routine diagnosis study illustrates this.

Sometimes in chronic glaucoma, but more regularly in the congestive variety, there are gastric disturbances of more or less severe type. They may vary from nausea to what looks like acute cholera morbus. After a few days the eyes look red and there is complaint of dim vision. For such things as these, the physician would naturally be consulted. Unless he knows that the relation of cause and effect may be from the eye to the stomach, he can easily reverse his process of reasoning. A single case will suffice to illustrate.

In 1901 a woman, 46 years of age, came to a well known ophthalmologist with inflammatory glaucoma in the right eye. Her vision was reduced to the moving hand. He made an iridectomy and the trouble stopped there. It is her history which is of special significance. She had been ill at home for nearly a month with headache, neuralgia, nausea and vomiting. It was known that vision was impaired, but little or no attention was paid to it. She was thought too sick to come to the city. She was warned, after operation, of the waste of important time and urged to seek advice at once if similar symptoms appeared in the left eye. It was ten years before they did. She came to me one afternoon after a dreadful trip on a bay boat. Nausea, head pains, and blurred vision were her symptoms. She came because of the warning given her and against the advice of her home physician. She had learned the lesson if her doctor had not. It was impossible to get her vision before operation. The condition present was acute inflammatory glaucoma of three days' standing. Iridectomy under ether was done the day she came to me and restored her vision to 20/30. Now, nine years afterwards, it is 20/40. The difference in the result of the two operations was merely the difference in time between onset and operation.

INFLAMMATORY GLAUCOMA

The diagnosis of the second variety of glaucoma to which I wish to call attention from the standpoint of this paper, is that in which ocular inflammation is present. Pain in and about the eye, ocular injection, etc., are enough to focus attention here, whether or not there are other symptoms. There are two possible errors of diagnosis unless a physician is warned about them. One is mistaking the injection for an ordinary conjunctival hyperemia; in other words, overlooking the filling of the circum-corneal and episcleral vessels. The other, which is of the gravest importance, is mistaking the case for iritis. The danger here is enhanced by the fact that atropia, necessary for iritis, plays havoc with glaucoma. The reverse is equally true. Miotics, needed in glaucoma, increase iritis. I have seen two such cases of mistaken diagnosis in which atropia was used. As a rule, the glaucomatous dilatation of the pupil should prevent such a mistake. This dilatation is not always

present and, so, only a test for tension can clear the diagnosis. Such primary mistakes as these can not be excused. Any one who undertakes to pass judgment upon a congested eye ought to know the difference between conjunctival and circumcorneal injection and the meaning of each. He ought to know how to test the size and action of the pupil and be able to draw correct inferences. He should be able to appreciate by digital touch any increased tension. If he is deficient in either, he will do less harm by refraining from any treatment than by acting upon an examination with insufficient knowledge. He should, however, master such primary essentials, for many physicians are so situated that reliable advice can not be readily obtained.

It is not a matter of wonder that a physician, suddenly called to a case of severe eye trouble, should make a mistake. Unless he was one of the few men who, during undergraduate life, was attracted to ophthalmology and unless his teacher so linked his eye instruction with pathological processes that the student associated the two in his thinking, he soon forgets the little ophthalmology he picked up in undergraduate days. As I tried to point out in a paper written for this Section two years ago,* the average student leaves the medical school with the impression that ophthalmology is a sort of artificial addendum to, and not an integral part of, general medicine. There is another reason. When a physician is so environed that he can not command skilled advice he must do the best he can. He may have been in general practice many years. He may not own an eye book and if he does, after brushing off the dust, he does not know where to find what he wants. But there are few men who do not take and read some journal. If you want to know why most of them skip the ophthalmic articles, go over the titles and read some of the highly technical and special papers appearing in the current journals. Most of them are very valuable to the specialist, but they do not touch the wants of a man who, through circumstances, must only now and then take the responsibility of an eye diagnosis. We write over, not their heads, but their wants. If our chairman is right in thinking that the physicians who take the JOURNAL of this Association regularly read the special articles, it is our duty to furnish something which may be of real use. It is this conviction, plus Dr. Stuckey's request, which has led me to inflict so primary a paper upon an ophthalmic audience. I trust that our general men may find something in it which will help.

842 *Park Ave.*

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DISCUSSION

Dr. J. A. Stucky, Lexington, Ky.—I am quite sure I express the sentiment of the majority of the men present when I say that I am very grateful to Dr. Woods for having told you some things for me. My thought has been directed to this subject because of a large number of cases of glaucoma I have met with in my clinics in the mountains. We have been seeing entirely too many cases in Central Kentucky, cases of eye trouble that have been treated for weeks and months at intervals as neuralgia or rheumatism, all needing correction of refractive error. Many of these cases "have gone the rounds" in the use of home remedies and "eye drops," and when they have come to me the vision has been permanently impaired. I have had many operations to do because these cases were not seen early enough. In the mountains we found an excuse for this condition, and I believe the reason is the large amount of focal infection due to the teeth, submerged tonsils and intestinal autointoxication. There is more need of dentistry in the mountains than any other one thing I know of. The majority of cases I saw had high blood pressure. I believe when the general practitioner is better taught, when he better appreciates his relation to his patient from the ophthalmological standpoint, and when we do not talk so much of so-called "high brow stuff," the general practitioner will feel just a little bit different towards us. I have seen some very humiliating instances where the general practitioner apologized for not having suspected the real eye condition—when he treated the eye for redness that he thought was a conjunctivitis, and treated the pain because he thought the patient had rheumatism in the joints as well as in the eye. It never occurred to him to take the reflexes, test the ocular tension and he did not examine the cornea carefully. The most important man in the medical profession today is the general practitioner, and I am sure if we give him the aid that he desires of us as specialists he will appreciate it.

My reason for asking Dr. Woods to write this paper was because I wanted some plain language and real help to come from some one just about as big as he is. I think he is just about as big as anybody we have in the South.

Last Thursday I saw a patient who had gone the rounds of what Dr. Woods calls the "psuedo-scientists." He had had his glasses changed seven

times in eight years, and when he came to me I found him with a dilated pupil, a hazy cornea, and wearing a minus-9. And that man was only forty-seven years of age. I have seen other cases where patients had been told they had incipient cataract, as mentioned by the essayist, and were waiting for the development of the cataracts. I fully agree that we ought to leave out that word "incipient." The patient has enough trouble without anticipating more. I want to endorse every word Dr. Woods said in his paper.

Dr. J. W. Jervey, Greenville, S. C.—I think we will all agree that while it is highly necessary that these conditions should be recognized early in order to save the eyesight of the victim, yet it is rather difficult in many of these cases for the ophthalmologist to determine the existence of a simple glaucoma. I must say that it seems almost a hopeless undertaking to try to teach the general practitioner the different tensions which would warrant the diagnosis of glaucoma, or even a suspicion of glaucoma. There is of course one way to get the matter before the general profession, and that is through the media of various general medical organizations; to have each ophthalmologist who is a member of his state medical society, or his county medical society, present the matter before the profession. It so often happens that the only complaint of a case of simple glaucoma is some apparent functional disturbance of the vision. These patients come in time and time again with no objective symptoms whatever—no peripheral injection, no dilatation, absolutely no glaucomatous haze, but in the course of the routine refraction if your ophthalmoscope is invariably used some of these cases will be detected. However, some of these cases of simple glaucoma show a sporadic tendency. They may show tension at one time, and at another time the tension is normal, even with the use of the tonometer, and these cases in many instances show not the slightest sign of cupping of the disc. It is not until the disease is in a dangerous stage that the patient notices a gradual diminution in the field, perhaps of one eye, perhaps of both, and then we are confronted with the fact that we have a case of glaucoma. But if a systematic examination with the ophthalmoscope is made in every case of refraction I have no doubt many cases of glaucoma will be uncovered which heretofore have been passed by unrecognized. I certainly hope that some method can be devised which would put the general practitioner on his guard in these cases.

Dr. Meyer Wiener, St. Louis, Mo.—There is very little to add to what Dr. Woods has said, except regarding the information to the patient as to whether the disease is cataract or not. Dr. Woods stated that he tells the patient or some one of the family that he has cataract. I infer from that that he does not himself tell the patient that he has cataract. I believe in truth in medicine and I believe the patient should always be told what is wrong with him, regardless of what the consequences may be immediately, because the patient will find out some time or other that he has cataract, and it will be a dreadful shock when he does find it out. He probably feels that you did not know what was the matter before, and it reflects discredit on the medical profession. I have had two or three instances in my practice, but I do not now let the patient get away without telling him what the condition is.

Dr. Woods mentioned the fields as most important in making a diagnosis of glaucoma. I do not think this can be emphasized too strongly—that we should look in the peripheral fields for glaucoma. We cannot always find defects in the field in glaucoma with an ordinary perimeter, but we must search for it with some such instrument as Dr. Peters' campimeter, or the Lloyds stereocampimeter; something that will find the blind spots in the field of vision. I agree that it is not only the general practitioner who needs to be educated, but ourselves. We should be careful about judging too hastily whether the patient has or has not glaucoma. I recall a case that came to us about eighteen years ago that had an acute attack of glaucoma, but refused operation. We treated her with eserin and the inflammation subsided and the tension became normal. She went to New York and consulted a gentleman who was considered the leading ophthalmic surgeon there. After many tests this man told her she did not have glaucoma; that he did not believe she ever had had glaucoma. I am not criticising this man, because I think he ranks among the three or four best men in ophthalmology in the United States; but I think he made a mistake in this case. The patient went home, and on the way had another acute attack, with the result that the vision of one eye is practically gone and that of the other greatly reduced. There is bare perception of light in one eye and about 20/40 in the other. Now if a man like that can make such a mistake, how can we expect the general practitioner to always recognize glaucoma?

Another thing, I think most ophthalmologists think they must find cupping of the disc in glaucoma, whereas in the acute stage there is no cupping; there may even be a blurring of the edges and hyperema. It is only when we have prolonged increase of tension that we have cupping.

Dr. J. A. White, Richmond, Va.—I agree with Dr. Jervey that trying to educate the general profession seems a hopeless task. Through a long experience I have many and many a time had people hopelessly blind from glaucoma sent to me to have cataracts extracted. I have written several papers along the same line and made addresses on the subject before medical societies, trying to educate some of the medical profession to our point of view, but I doubt whether I have ever made many converts.

Dr. Woods' paper, properly speaking, should have been read before the Section on Medicine if he expected to convert anybody or to educate them so that some of the many blind people in this country might be saved from that blindness. It is my experience that notwithstanding the enormous advance in ophthalmology in the last twenty-five years, the general practitioner of medicine takes no interest whatever in eye diseases, and I have myself noticed that the profession in our largest cities have not the slightest knowledge of eye disease, not even a rudimentary knowledge. That is my experience among the general profession where I live, and I believe it is the experience of all of you. So I repeat that this paper should have been read to the people we want to educate, not to us, not one of whom will

take issue with Dr. Woods in a single word he has said. I hope the paper will be published in such a way as to come under the observation of, at any rate, the members of this Association, who, if they read it carefully, may apply its lesson to a good end.

Dr. H. H. Briggs, Asheville, N. C.—I want to emphasize what the last two speakers have said about our responsibility, the ophthalmologist's responsibility, in this matter. It is true that the optometrist has done a great deal—or rather, his lack of knowledge of pathology has caused a great many cases of simple chronic glaucoma to go on to the stage where operation is futile. But he is not to blame so much because of his lack of knowledge of a trouble which is not optical, but pathological—a disease of the eye. If the general practitioner's knowledge of disease is not adequate he can refer the patient to the ophthalmologist, but we as ophthalmologists have often been remiss and have not carefully examined and diagnosed these cases. We are prone to refract cases that come to us with diminution of vision, and fail for weeks or months to detect glaucomic symptoms which a proper examination would have revealed in the beginning.

Another point is that every case of diminished vision which can not be corrected by refraction, and which can not be accounted for in any other way, should be suspected of being a symptom of simple glaucoma. We should never use a cycoplegic in any case until we are reasonably sure there is no increased tension, and that beginning glaucoma is not present.

Dr. E. H. Cary, Dallas, Tex.—The point we seem to be trying to make is that no greater amount of progress has been made in educating the medical profession. I agree with the Doctor that a paper of this kind is not much appreciated and has not much effect on the man who is practicing who has not had a correct conception of this when he was a student. My observation through years of experience has been that we have an inver-increasing list of mistakes, and I have been led to believe that the worst cases are those who have been deterred through bad service from going to some one who might have been capable of making a real diagnosis, this delay brought about by advice from the general practitioner who himself did not have in his early training a correct conception of the subject nor the fear of God instilled into him. I can recall distinctly that the question of ophthalmology and these other subjects as taught by Dr. Noyes did not impress me, and none of us passed the examinations. We were not required to pass the examination. The teaching for many years has put the fear of God into the heart of the student, but it is up to the teachers, to those men who actually teach. If the teacher has a right finally to require an examination that examines and will actually exclude the student from getting his diploma unless he passes, then he can put the fear of God into the student's heart and he will go out thoroughly convinced that there are one or two things he must know. One is the differentiation between iritis and glaucoma—he must know that in detail, and there is reason in it. I have been watching this for years, and I find these men do not make mistakes. Do not try to get your general practitioner so well educated that he will be able to make a diagnosis; but he can be afraid of making mistakes, and he will do something to avoid making mistakes. If you have done that you have made progress. I think the progress is marked in recent years and will continue, but mainly through the students now being taught.

Dr. Hilliard Wood, Nashville, Tenn.—We have all had those sad cases come to us in which, through an error in diagnosis by the general practitioner, the vision was practically totally lost. The evil of an error in diagnosis is twofold: in the first place, no good is accomplished by treatment; and in the second place, positive harm has been done by treatment, which is usually atropine or nitrate of silver, depending upon whether it was called an iritis or a conjunctivitis, but alas! the time of election for operation has been allowed to pass.

I rise more especially to call attention, in the early diagnosis of glaucoma, to a syndrome laid down by Colonel Elliot on his visit here in 1913: three symptoms of the earliest stages of developing glaucoma. These three symptoms are: plus tension, as taken by the tonometer, and not with the finger; reduced central vision; and contraction of the field, as taken by the perimeter. These three are the best guides in the early stages, where there is still a question in one's mind as to the correct diagnosis. But glaucoma, especially the more chronic types in which a diagnosis is most doubtful even in your mind and mine, develops more or less intermittently, and in the intervals between the attacks the patient will not even show this syndrome of Colonel Elliot. It has been my custom, where the patient lives within reach, to have him come to me during the attack and then examine for the symptoms to which I have referred. I believe if we wait to make a diagnosis until cupping of the disc and dilated pupils appear, we will let go by the time when we could have done something for our patient.

Dr. Hiram Woods (closing).—I agree with what Dr. Jervey and Dr. White have said about the almost "hopelessness" of educating general practitioners, especially those in long practice. At the same time, I think there are a few bright spots on the horizon. One of them is the education of students, spoken of by Dr. Cary. They should not be burdened with instruction about matters we do not understand ourselves. Our efforts should follow the recognized lines of diagnosis. A teacher should not be satisfied until he has drummed and drummed, and drummed and drummed into students the meaning of certain signs and symptoms of iritis and glaucoma as differentiated from those of conjunctivitis. The insufficiency of such diagnosis as facial neuralgia, chronic rheumatism, etc., with treatment by cold tar products, should be pushed home.

This brings us to another bright spot. When these extraocular symptoms (gastric, neuralgic, rheumatic, etc.) appear, they now make the general practitioner look for a focus of infection or peripheral irritant and, if in this search, he can be made to realize that the eyes ought to be taken into account, such a trouble as chronic glaucoma may be found earlier. Before he got

to looking into these matters, when he was content with a diagnosis of "rheumatism," when he asked a man if he had ever had a chancre and, if he said "No," let it go at that—conditions were hopeless. Now many practitioners are going further and want an eye examination. What should the oculist do? Mere routine study of vision, refraction error, etc., is insufficient. Perimetry and tonometry should be parts of our work.

With regard to Dr. Weiner's criticism: he thinks a patient ought to be "told the truth" when he has a "cataract." Of course, in so far as misstatements are concerned; but what is meant by "cataract" and what false impressions can be conveyed by the term "cataract" to you may mean a peripheral, non-progressive opacity in the lens; to the average layman it means slowly progressive blindness to an operation which may or may not succeed. We all know there are hundreds and hundreds of cases of peripheral striations which never come to an operative stage. These opacities do no harm; they do not get worse. What is the use of frightening a man with the idea that he is going blind? Call it "peripheral striations," tell him there is a little cloud at the edge of his lens and it should be watched; but while he has useful vision do not torment him with the idea that he is going blind. You are telling him the truth; you are simply avoiding that particular presentation of his condition which will scare him and make him think everything else is due to "cataract." To some extent you can dangerously mislead him. See quotation from Fuchs and case narrated.

What Dr. Weiner said about the campimeter is true. You can get a small scotoma with the campimeter that you can not get with the ordinary perimeter.

Dr. Woods has called attention to a very important matter. If we wait, in diagnosis, for the cupping of the disc, we are often too late. This brings me to another thing that I will take the liberty of speaking about for just a minute. Oculists should compel themselves to make perimetric examinations. A short time ago a man under examination before the American Board of Ophthalmological Examiners was asked to take a field of vision. He replied that he owned a perimeter, but used it as a hat rack; that he had not time to take fields because he was too busy with routine cases; it took him too long to get through. He knew nothing about perimetry. If this was his point of view, certainly many of his patients over forty got away without the sort of examination they needed. I have discovered cases of early glaucoma simply by making myself go through this routine. It is a branch of ophthalmology that has been sadly neglected.

After all, the thing gets down to what Dr. Cary has said: we must make the average young man afraid to make mistakes, and if we accomplish that we will do much.

AN ATYPICAL MASTOIDITIS FOLLOWING A STAPHYLOCOCCEMIA*

By H. Marshall Taylor, M.D.,
Jacksonville, Fla.

It is the intention of the writer in the preparation of this paper to discuss the hematogenous infection of that type of mastoid disease which has been classified as primary mastoiditis or idiopathic mastoid abscess and to report a case of more than passing interest.

While the subject of primary mastoiditis is not a new one, in searching the literature on this subject the writer is surprised to find how little definite information has been thrown on those of hematogenous origin.

In the review of 40 cases of primary mastoiditis only 7 of these are stated to be of hematogenous origin. Plisson reports 1 case, Humblet 1, Labarre 1, and Chauveau 4. In only 1 of these cases is the affecting organism stated.

Plisson reports a case of general infection (perhaps influenza) in a man, age 22, with mastoiditis without involvement of the middle ear. Mastoid pus showed streptococcus in pure culture. He believes this to be a hematogenous infection. He states that primitive mastoiditis without middle ear involvement occurs most frequently in influenza, but also in other general infections.

Humblet reports one case in a woman, age 27, history of a broken and sensitive tooth. Redness and tenderness over the mastoid. No sign of middle ear involvement; tympanum absolutely normal. Infection was probably hematogenous. No bacteriological examination.

Labarre, in 1912, reported one case of primitive mastoiditis in which there was no sign of middle ear involvement and no previous history of ear disease. This case was reported as of hematogenous origin. The infecting organism was not mentioned. Chauveau reports 4 cases of primary mastoiditis. The original article was not attainable.

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*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

Of the 40 cases of primary mastoiditis reviewed, 4 of this number showed a staphylococcus infection.

Brieger reports one case of primary mastoiditis not due to middle ear suppuration in which staphylococcus aureus was found in the pus. He does not state source or mode of infection, but notes that the staphylococcus aureus is one of the frequent organisms in osteomyelitis.

West reports one case in a girl, age 14, of mastoiditis without involvement of the middle ear. The pus showed staphylococcus. The case was complicated by malaria and malarial parasites were found in the blood. No mention of staphylococci in the blood and no attempt to explain the cause of the mastoiditis. White blood count was 14,000.

Of these cases reviewed in twenty-two there was no mention of the type of bacteria found in the mastoid process. In sixteen there was no attempt to indicate the source and mode of infection. In seven cases which were reported to be of hematogenous origin, in only one case was the type of organism mentioned. In searching this literature the most conspicuous fact was the infrequency of the report of any investigation of the bacteriology of the blood.

After the study of the literature on this subject with the observation as just stated, one could hardly escape the conclusion that the question of hematogenous infection of the mastoid apophysis has not received the attention and investigation which one at the present day would expect. Perhaps the explanation has been that the condition is a rare one, and for this reason few cases have been studied by the one individual.

However rare the condition may be, we know that it does exist. Rosenow says:

"The hematogenous origin of infection in regions which do not normally harbor bacteria, such as the endocardium, pericardium, joints and bone, is accepted."

Dabney, in his excellent contribution on "Idiopathic Mastoid Abscess," says:

"The hematogenous theory of mastoid disease rests on a sound and scientific basis."

In osteomyelitis we have the parallel of the infection of the mastoid process through the blood stream. Keen says:

"The infection of the bone is often secondary to local infection (such as a furuncle or carbuncle) and the infecting organism may be carried from such focus by the blood and cause acute suppuration of bone in distant parts of the body."

In the study of osteomyelitis we learn that in the vast majority of cases the infecting organism is the staphylococcus pyogenes aureus and that it is generally found in pure culture. Barker, in his "Monographic Medicine," says:

"Multiple purulent metastases are very common in staphylococcus sepsis. When the cocci go over in the blood, the blood culture is sometimes positive, but is often negative, as the cocci are quickly removed from the blood by the organs (in contrast with streptococcus sepsis)."

The writer further states that the diagnosis of staphylococcus sepsis is made by finding the primary focus of infection, blood culture and cultures from the metastatic abscesses.

On becoming intensely interested in this case which I am reporting, I questioned my distinguished instructor of former days, Dr. Dench, as to his opinion relative to this history and pathology. His opinion, which is always of interest, is as follows:

"There is absolutely no reason why a staphylococcus in the blood stream should not give a metastatic abscess in the mastoid as well as in any other part of the body. If such a focus should exist the metastatic abscess would be independent of the middle ear and the drum membrane might be normal."

With the courtesy of the Society, I will report this case of atypical mastoiditis following a staphylococcemia. This case is worthy of publication on account of the interesting and unusual history, the condition of the middle ear, the type of mastoid involvement and the bacteriemia.

The patient, M. M., female, age 19, robust, no family history of tuberculosis or syphilis, was referred to me on September 1, 1919.

History.—For two months patient had suffered from a recurring furunculosis scattered generally over the body, principally on the lower extremities. No furunculosis of the external auditory canal. Patient first consulted me on account of a furuncle the size of a pea over the left eye brow. The furuncle opened and the swelling rapidly subsided. Pus showed a staphylococcus infection.

On September 6, the patient called again at my office complaining of a deep-seated pain back of her right ear. The middle ear was examined; fundus presenting a normal drum membrane; no scar of a previous perforation; hearing not impaired. Patient was advised to report at the end of two days for further examination.

On September 8, the patient was again seen, this time complaining of increase of pain, particularly at night. A sensitiveness to pressure

existed over the mastoid tip; no tenderness in the region of the antrum or emissary. Eustachian tube was catheterized. No fluid could be detected in the tube or middle ear. The patient's temperature was 100°, pulse 120.

On September 10, 11 and 12 temperature oscillated between 99 and 101°; pulse, 110 to 120. On September 13, a blood culture was taken and a differential blood count showed 20,000 white cells, 85 per cent polynuclear. On September 15, report of the blood culture stated that a staphylococcemia was present. A roentgenological study was made and the following report was received: "There is a general loss of density throughout the lower half of the right mastoid and a haziness of cell outline which would suggest an acute mastoiditis."

A simple mastoid operation was immediately performed. Removal of a thin cortex revealed a large tip cell containing pus, and the immediate adjacent cellular structure showed a beginning caries. In the upper part of the mastoid and in the region of the antrum, macroscopically the bone presented only a hyperemia and no pus was evident. The antrum was opened; no granulations were present and no evidence of disease. The sinus was exposed, which showed a normal color. The pus culture from the mastoid showed a staphylococcus aureus in pure culture. The mastoid was closed except at its lowest extremity and a small drain introduced. On the following day the patient's temperature was normal. She stated that her headache no longer existed. An uneventful recovery followed, patient leaving the hospital on the ninth day with the mastoid wound entirely closed.

To review this case briefly, there was a recurring furunculosis extending over a period of two months. This can be interpreted as the primary focus of infection. A blood culture showed a staphylococcemia and the metastatic abscess gave the staphylococcus aureus in pure culture. To the writer it would seem that this would make the diagnosis of a hematogenous infection complete.

In reading medical literature one can but come to the conclusion "that there is nothing new under the sun." I make no claim to priority in the report of this case, 'though in the literature reviewed I was unable to find where there was any record of a case of primary mastoiditis in which the organism was isolated in the primary focus of infection found in the blood stream and in the metastatic abscess.

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DISCUSSION

Dr. John J. Shea, Memphis, Tenn.—I think we owe a vote of thanks to Dr. Taylor for giving us a report of a case that has been worked out so thoroughly. Of course, he tried to cover up his scientific investigations by saying that in taking his first culture he did so in order to obtain the offending organism for an autogenous vaccine, but nevertheless he obtained the organism in its primary focus and the organism from the blood stream. The isolation of a staphlococeus from the blood stream is very difficult because the interval in which the organism may be isolated is very short.

The question always comes up of the blood culture becoming contaminated, and in talking this over with Dr. Taylor he said that the laboratory reported this as a true bacteremia.

The latest work on the reformation of bone is that bone reforms from the Hoversian canal system. I imagine it was through this system that this atypical mastoid began to suppurate, for it is difficult to see any other explanation than that the bacteria become an embolus and lodge in the mastoid.

I think it is also impressed upon us that an x-ray should be taken in every one of our mastoid cases before we operate. It is of value to give you the landmarks and in a case where the ear is as near normal as this one, only with the aid of the x-ray would we be justified in doing a mastoid.

Dr. H. H. Briggs, Asheville, N. C.—It seems to me Dr. Taylor has come more nearly bringing to us a true case of primary metastatic mastoiditis than any case I have reviewed. It is true that perhaps the exacting bacteriologist would not accept the findings as true proof, especially if the postulates of Koch had to be satisfied, but nevertheless to us he has proven his case. He has found the organism both in the blood stream and in the furuncle. Whether it is a true bacteremia and metastasis may be questioned, but as I remember the furuncle was on the left side of the face and the mastoiditis on the right side, and it would be rather difficult to see how the lymph channel could be the sole means of carrying the infection. Finding the middle ear free from inflammation does not mean that the infection might not have gotten through the Eustachian tube in some way. This would be rather farfetched, but is possible. I have seen one case somewhat similar to the doctor's, in a doctor's family, where there were the usual mastoid symptoms of pain and tenderness, with no evidence of otitis media. The pain was so severe that a paracentesis of the drum membrane was done, but no evidence of otitis media; later a mastoidectomy was done, and no evidence of pathology was found in the antrum, but going down to the tip the large cell was found full of pus. I am very glad that Dr. Taylor presented this subject so scientifically and gave us the benefit of his observation.

Dr. Clifton M. Miller, Richmond, Va.—Two years ago, when this Section was to have met in Asheville, I had prepared a report of two cases in which bacteriema was not proved. The blood stream was not examined and beyond low grade infection in the postnasal spaces and around the tonsils, there was no focus of infection that we could find. But both cases were mastoid abscess without middle ear infection. One of them I was satisfied must have gone through the middle ear. It was a child and it waked up in the night crying with earache. I did not see it for a week after and at that time the drum was perfectly normal, so it must have had some low grade infection at the time. This must have gone into the mastoid antrum, but I did not get to operate until there was a subperiosteal abscess. The other case was a subperiosteal abscess also and was advised to be operated upon a week before he consented, and then the swelling behind the ear had become very marked. In spite of this post-aural swelling the antrum was dry. The perforation had been low down over the tip. He had an old, long-continued case of infection in his naso-pharynx. Both of them were x-rayed carefully before operation and I do not see how we can finally make up our minds to operate on these, in spite of the high blood count, without the x-ray. I think that is a great essential in the diagnosis of these cases. The source of infection we must work out. Neither of these were "flu" cases. This was prior to the epidemic.

Dr. J. A. Stucky, Lexington, Ky.—Anything atypical is always interesting and important, simply because we do not always look for the unusual. Less than three weeks ago a lady came into my office, sent to me by a group of physicians who had gone over her very carefully; she had been treated for five weeks for fistula. Five days before she had earache, which she learned was due to a diseased tooth. Extraction of the tooth relieved the earache. Examination by an otologist found no trouble in the ear. Then she began to have severe pains in the back of the head radiating to the left eye. This increased and she was sent to me because of slight swelling in the left temple and edema of the eyelid. Examination of the eye was negative except for this swelling, which looked to be entirely superficial. There was no trouble in the nose or accessory sinuses, the throat was normal, and I could not account for the headache. The drum membrane was a little congested, but no evidence of trouble in the middle ear. I then had an x-ray made and, very much to my surprise, it revealed evidence of disintegration not only of the entire mastoid, but in the posterior zygomomatic root. There were no clinical symptoms, no pain on deep pressure, no sagging of the posterior wall, none of the usual symptoms of mastoiditis. On the strength of the revelation of the x-ray I operated that afternoon and found a most unusual condition in the mastoid. She had a very small mastoid, no antrum practically, just a cell as large as a pea. There was pus in the tip; there was pus in the zygoma roots; there was an extradural abscess containing perhaps a dram of pus, and the lateral sinus from elbow to knee was covered with thick granulations and both the middle fossa and posterior fossa were involved. There was no cerebellar abscess. The patient has been in the hospital eighteen days and is walking about. That was an atypical mastoid revealed by the x-ray after all other causes had been eliminated, everything except something in the eye. A blood examination showed 11,700 leucocytes. Examination of the pus showed a mixed infection with staphylococcus aureus predominating. This woman had had "flu" fourteen months before and had a baby twelve months old. She is getting well. That was atypical. It taught me a lesson which I present to you.

Dr. W. W. Black, St. Louis, Mo.—Did you exclude tuberculosis in that case?

Dr. Stucky.—Yes, and the Wassermann was negative. She had been examined by a group of good men before I saw her and would not have been sent to me except for that little swelling in the eyelid which was due to involvement of the soft parts covering the posterior root of the zygoma.

Dr. Taylor (closing).—In closing, I can not refrain from emphasizing the importance that the cases which are recorded as primary mastoiditis should be worked out more thoroughly. The review of the literature of primary mastoiditis shows little evidence of any investigation of the bacteriology of the blood and it would seem that this would explain why the subject of idiopathic mastoid abscess has not been more closely associated with infections through the blood stream.

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HUMAN WRECKS

Some years ago a physician was requested to examine an active and very important business man, a millionaire, who had applied for a policy of $500,000 in a large life insurance company. He declined to make the examination, preferring to lose a fee rather than to examine a man in whom he saw evidences of early senility and for whom he could not recommend insurance. The insurance agent, whose commission on a policy of that size would have been a large sum, insisted that his client was in perfect health and that he should have the policy, so he requested the medical director from the "Home Office" of his company to make the examination. The medical director declined the risk and his judgment was verified, because a few months later the millionaire developed paresis and after an illness of a year or two died.

In discussing this case, the medical director of this "old line" company said that the worst classes of risks with which his and other life insurance companies have to deal are the successful business and professional men, the finest type of men in every community, who have large incomes and who apply for policies of from $50,000 up. He said that the age of expectancy of such men is low, that they stand perfect physical examinations, and in a few years die of some form of the degenerative diseases, i. e., of the heart, arteries, kidneys and brain.

In his twenty-five years of practice the writer recalls a number of cases of men who consulted him for symptoms of indigestion, but on examination it would be found that they had a rise in blood pressure, with a trace of albumin and a few casts in their urine—early evidences of arterial degeneration. They gave no history of any disease or infection that could account for the condition, but they admitted sedentary habits, business worries, overwork and long hours. Often, in addition, they ate excessively, particularly of meats, smoked immoderately and only too frequently were guilty of over-indulgence in alcohol. They were warned that they were traveling the pace that kills; some learned to live rational lives and were saved; others, however, corrected their unhygienic habits for a few days or weeks, but they were "in the game" and could not see where they could quit or slow up until a stroke of apoplexy, angina pectoris, heart failure, Bright's disease, mental breakdowns, or other serious or fatal diseases developed, when nothing could be done for them.

OVERWORKED WOMEN

The mental and physical wrecks that we see every day are not confined to men. Every observant physician knows that the most overworked class of people with whom we have to deal are the mothers and home-makers, who are the first ones in their homes to begin work, and there they remain all day and until late at night, caring for their children, worrying over

servants—the deadly drudgery of housekeeping. Another class who break down early are the society women, church workers and others who live on excitement; and who in addition to their social obligations or philanthropic efforts have the responsibility of caring for home and children.

Every physician who has had a large experience in dealing with chronic diseases has been saddened to see many useful men and women die in their prime of tuberculosis, heart, kidney and arterial diseases. These human wrecks represent the best and the most useful members of their communities, they are well educated, some of them highly intellectual, i. e., successful business men, college professors, lawyers, statesmen and leaders in all lines of work; and the women are of the highest type of culture and loveliness; they are well read in a general way, yet they are woefully ignorant of the first principles of physiological living.

THE CARE OF THE HUMAN ENGINE

It is strange that men pay so little attention to the human engine, which must have the proper fuel to generate energy for its work and every part of which must be running smoothly, or it can not carry its load. The locomotive engineer inspects each essential part of his engine every day before it starts on its journey, and every few weeks or months it is given a thorough overhauling. This is done to prevent breakdowns on the road and to prolong the life of the engine. The man who owns a fine automobile sends it to the mechanic once a month for inspection and once or twice a year he sends it into the shop for general repairs. Yet the engine upon which depends his success in business, and even his life, goes without thought of preventing trouble, with a load that overtaxes its power from year to year, until finally it is wrecked and the load (business and family affairs) which it hauls is thrown into the ditch.

There is no doubt that many of the mental and physical wrecks that we see about us every day could be prevented if men looked after their bodies with the same care that an engineer looks after his engine. One must first learn the physiological functions of every part of the body, as the engineer has to serve an apprenticeship to know the workings of every piece of machinery in his engine; and after a man learns his physical needs he must make up his mind to give up a small part of his time each day to caring for this human engine which, when worn out, can not be replaced, and which has a greater money value than the iron and steel machine that hauls a railroad train.

HEALTHFUL LIVING AND EFFICIENCY

Human efficiency consists in accomplishing the most from expended effort with the minimum waste of energy and with the least wear and tear of mind and body. It should be considered in terms of a life time and not for periods of days and months; and one should study himself and his environment with the view of learning the pace that he can go and be most efficient throughout the years of his business or professional career.

Human efficiency depends more upon health than everything else. The person who is suffering pain, or who has eyestrain, or who is weakened by disease, turns out work poor in quality and quantity. It also depends upon habits which in turn affect health. The man who sleeps not more than four or five hours at night can not be 100 per cent efficient the next day.

THE CURVE OF EFFICIENCY

A person can not expect his output of work to be the same day after day, and

year after year, because even when conditions seem the same a person's ability to turn out work varies. Without any reason that can be accounted for on one day the normal person feels like working and he is at his maximum of efficiency; while under the same conditions, in a few hours, he finds himself unable to concentrate his attention on his work, and "everything goes wrong." This rise and fall in efficiency corresponds to, and is no doubt dependent upon, the "curve of health" that Dr. Oliver Wendell Holmes speaks of in "Over the Tea Cups." By properly regulating one's daily life one can, to a certain extent, control this "curve of health" and efficiency, though one can not be the complete "master of his fate." It is important to watch this curve, particularly to take heed of the "descending movement" which, if it goes too low or occurs too often, indicates that something is wrong with the "dynamo"—it needs rest or overhauling.

In the journey through life one should conserve his vitalities and not go at "full speed" all the time, because then he has not the reserve to draw upon for the emergencies that come in the career of every one when for a time every nerve must be strained to overcome seemingly insurmountable difficulties. After such strains one should rest to recuperate his vital forces.

THE EFFECTS OF FOOD AND ENVIRONMENT

Efficiency depends upon food. The human engine needs the proper fuel to carry on its functions; and the man or woman who eats too little has not the normal physical strength and endurance, while the one who gormandizes is sluggish in both mental and physical activity. Efficiency also depends upon eliminating the waste materials from the body. The man or woman who is constipated absorbs toxins from the intestinal tract that poison the brain cells, thus depressing or perverting mental processes.

Efficiency also is influenced by environment. If the room in which a person works is badly ventilated, the mind is dulled and keen mental activity is essential for good work; if he is too hot, or too cold, his energies are dissipated; if his place of business is in a dark and gloomy building, or if his surroundings are unhygienic in any way, mental activities are diminished; if his associates are not congenial, or if he has not the co-operation of those above or below him in his business, he loses morale.

The mental attitude has much to do with efficiency. The man whose mind is free from cares can work with better effect than one who frets and worries over every little thing that goes wrong. The person who is overcome with grief, or who gives way to anger, or who is envious or jealous of others around him, either turns out low-grade work or does nothing at all.

EFFICIENCY IS APPLIED PHYSIOLOGY

Everything else being equal, the person who has the best and the most practical working knowledge of physiology and psychology, the hygiene of living, will be most efficient. It therefore behooves the earnest worker and the wise man, whether he be the laborer in the factory, or the man who owns the plant, or whether he be a farmer, a minister, or a lawyer, to get all the information that he can regarding personal hygiene, either from his physician or from any of the number of excellent books on the subject; and the physician should be prepared to teach personal hygiene to his healthy patrons who desire to keep well and to his convalescent patients. One of the best books that has been published for lay reading is "How to Live," by Professor Irving Fisher and Dr. Eugene Lyman Fisk, of the Life Extension Institute, a philanthropic organization in New York City. Another is Pyle's "Personal Hygiene," published by W. B. Saunders Company. There are many other good books

that relate to physiological living that any person can study to advantage.

After learning all the physiology that he can, then with the aid of a skillful physician, he should study himself to see if he has any faulty mental or physical habits that may in time interfere with health and efficiency; and he should, with equal care, examine his environment to determine if his surroundings can not be improved upon in a way that will facilitate his work. It is as much the duty of a man to keep himself fit and efficient as it is to see that his cash balances every day, or that the machinery of his business is properly adjusted and capable of its maximum output.

STARVING VIENNA

Before the Germans forced Austria into war against France and the rest of the civilized world, Vienna was a great medical centre for American physicians, who desired to add to their home training a course in some of the European clinics. Thousands of American physicians have studied under the many celebrated men connected with the University of Vienna. While there they entered into the gay life of the Vienese and they have pleasant recollections not only of the Allgemeines Krankenhaus, but of the prater, the opera, and of the music and the joy that seemed unconfined in the beautiful capital of the great Austrian-Hungarian Empire. When American physicians left "old Vienna" it was with the sadness of an "auf weider sehen" rather than farewell, because every one expected some day to return to the delights of the gayest city in Europe, excepting only Paris.

War has changed things. The mighty Austro-Hungarian Empire is no more and Vienna, its capital, no longer resounds with music and gay laughter; but squalor and starvation seem to be the lot of those who formerly lived in luxury. Vienna, formerly a city of 2,000,000 and the metropolis of the great kingdom of Austro-Hungary, is now reduced to poverty and is the capital of a starving nation without standing in the world. Hundreds of thousands are without employment and there seems but little hope for the future. The pitiable condition of the Vienese is depicted in a letter from Prof. Adolf Lorenz, the great orthopedic surgeon, who, in an appeal for American aid to his helpless people, says:

"Our plight seems to become more and more distressing. We must repeat it again and again that the crippled state of new Austria can't live by itself alone, having been deprived of all its former resources—not being able to produce more than the fourth part of food wanted by its six millions of inhabitants and having neither coal nor the necessary raw materials to work into industrial articles, to buy food with, Austrian money having become nearly worthless.

"If this hopeless condition of new Austria is not grasped to its full extent by the outer world very soon, the twentieth century of progress and civilization will witness the spectacle—unheard of in the history of mankind—of a people doomed to die of hunger, although they are intelligent, skillful and willing to work."

Prof. Lorenz did not say anything of the condition of the really great men at whose feet many Americans have sat in learning scientific medicine and surgery, but from information obtained from other sources their condition is pitiable. It is said that many Austrian physicians, in the gloom of defeat and in the despondency that goes with undernourishment, seeing no future for their country, have taken their own lives. Among them was Dr. Adolf Schmidt, who had moved from Dresden to Vienna a few years prior to the war. The fate of others is not known. No doubt many of them are living, but the prestige of Vienna as a medical center has gone and American physicians may never again go to Germany or Austria for the knowledge and the inspiration that were partly responsible for the development of scientific medicine in the United States.

Physicians are not among the wealthy classes who can contribute large sums to charities of any kind; but no doubt some

of them, particularly those who have studied abroad, will want to lend a helping hand to the people among whom they lived for a time and who in the days that have passed made life so delightful in old Vienna. Those who desire to make contributions may send their checks direct to the American Relief Committee for Sufferers in Austria, 261 Madison Avenue, New York, with the assurance that it will reach those who need it most.

NATION-WIDE HEALTH WEEK

Last year rumor had it that the Anti-Tuberculous Association, with its wonderfully organized machinery for publicity, was to launch a campaign for the observation of a so-called "Health Week," during which time every man, woman and child in the United States would be urged to undergo a physical examination. Thus, every one was to pause and "take stock," so to speak, of his own store of health, learn where his stock was run down or entirely exhausted, and be advised of the best way again to approach the normal. For some reason the plan was not executed.

The vast amount of good that would have resulted had this almost impossible undertaking been accomplished, is beyond estimation. Most persons treat their automobiles with far greater consideration than themselves, for when the car develops a little knock, a squeak, or rattle, it is quickly taken to a mechanic, for the principle of prophylaxis in mechanics is well understood. However, when the human machinery begins to show signs of derangement, it is often run on to the point of breakdown, when certain worn-out parts, which can not be replaced, must be removed or at best only patched up. Using the same figure still further, the automobile owner is very apt to take his car to the shop periodically for overhauling and inspection regardless of whether or not there is manifest trouble. In other words, the inevitable results of wear and tear are anticipated in an effort to detect any serious change in its beginning. Rarely is this so with the human machinery.

Analyzing the plan, one finds that it would be a physical impossibility for most physicians to take a history and make a complete physical examination of all their clientele in one week's time, as well as attend to the regular number of ill who normally apply for services. While such a scheme would be impractical, it might be substituted by a "booking week," as it were, when all persons could be assigned appointments for future dates.

One could hardly conceive of a more progressive or more forward step in preventive medicine. Let us hope that either the Anti-Tuberculosis Association, the Red Cross or some other beneficent society will back this very worthy movement. Obviously, the physicians can not be the prime movers in its furtherance, because selfish motives would be certain to be ascribed to the profession and the opposition might even effect the abandonment of the plan. Diplomacy would demand that the movement be initiated by the laymen themselves through the medium of one of the great benevolent organizations mentioned above. The idea is entirely too good to be abandoned without a fair test.

THE HYDRA-HEADED MONSTER OF MODERN MEDICINE

Laws have been passed making fee-splitting a crime punishable by revoking the licenses of guilty surgeons and physicians, or by imprisonment; physicians and surgeons have denounced as deep-dyed villains those engaged in the nefarious practice of trafficking in human lives; medical societies and surgical organizations have waged war against this cancer that is eat-

ing into the vitals of the medical profession; and still the fee-splitters and their dupes whom they tip as they do boot blacks and other lowly hirelings are said to wax fat in the land. What is to be done to destroy this monster that makes cringing criminals out of men in the noblest of professions is a question that has perplexed the right-thinking men in medicine for the past two decades.

The most illuminating discussion that the writer has heard on the subject was at the recent meeting of the East Tennessee Medical Association following a paper on "Fee-splitting" by Dr. S. H. Hodge, of Knoxville, Tenn. In this paper, which was published in the December number of the SOUTHERN MEDICAL JOURNAL, Dr. Hodge, in no uncertain language, denounced the fee-splitter, and frankly said that there was no denying the fact that in east Tennessee the practice of dividing fees still flourishes. His paper was read about 8:30 at the evening session and the discussion, which was participated in by fifteen or twenty physicians and surgeons, lasted until midnight. Many suggestions were made as to means of stopping the traffic in patients and there were differences of opinion as to whether the surgeon or the physician is most responsible, but the fact that every speaker condemned the practice makes it certain that no self-respecting physician or surgeon in East Tennessee is guilty of dividing a fee with a physician without the full knowledge and consent of the patient.

The fact that there was not one physician who would defend the practice shows that though fee-splitting is still practiced it is considered less respectable than formerly because it has not been many years since physicians and surgeons, on the floors of medical meetings, defended the division of fees between the operating surgeon and the physician who referred him the case. Less than a decade ago there were several medical journals of wide circulation who defended the practice, but today there is no physician or surgeon so careless of his reputation as to say anywhere, except to his partner in crime, that there is any excuse whatever for the man who refers a patient to another physician to receive more for his service than he is willing to charge his patient. All will agree that the general practitioner does not charge enough for his services when he is compelled to go with a patient to a surgeon, but no honest man can condone his getting a fee from the surgeon who buys patients.

It was suggested by one of the speakers that the discussion on fee-splitting was largely wasted because the guilty ones are ashamed to associate with honest physicians, and therefore do not attend medical meetings. Another speaker said that there are still physicians, particularly in the rural districts, who have not realized the criminality of the graft that they were receiving from designing surgeons who try to make it appear that they are looking after the interest of their friends who refer them patients. Following this, the suggestion was made that a copy of Dr. Hodge's paper with a report of the discussion be sent to every physician in Tennessee, whether he be a member of a medical society or not. The latter suggestion seems to be one that could help to stop the practice, though for a long time to come there will probably be men in the practice of medicine and surgery who would sell their souls for dollars.

It is probable that there is no more fee-splitting in east Tennessee than in other parts of the country, and the subject should continue to be a live subject at meetings of other medical societies. If every state medical association in the United States would have prepared and published a series of articles on fee-splitting and would send copies to every physician in their respective

states, whether they are members of medical societies or not, it would open the eyes of many to the evils of the practice. Such a campaign of education among medical men probably would not stop the practice entirely because there are some who have no conscience and whose greed can not be satisfied in legitimate practice; but it would surely help to decrease the crime of fee-splitting and would prove that organized medicine will not tolerate questionable methods of practice by members of the medical profession.

OPERATOR vs. SURGEON

Clever operators, who achieve great dexterity and rapidity in their technic, are looked upon by the public as great surgeons, while in many instances great surgeons are regarded by the medical profession as most ordinary operators. For instance, one of America's genuinely great surgeons is a man possessing a profound knowledge of surgical principles, a keen diagnostic acumen, a broad knowledge of pathology, an originality in operative procedures, and yet he is so slow in executing his almost perfect technic that his waggish assistant remarked that his "Chief" was contemplating turning away all cases of malignancy because he could not keep up with the metastases.

It is true, however, that many of the really great men in surgery are clever operators, and it is highly desirable to combine speed and skill with perfect technic; but manual dexterity is only one of the desirable attributes of the surgeon.

It is the operator's ambition to operate upon as many patients as possible just as the lawyer with overweening ambition wishes to try as many cases as possible. The surgeon's ambition is to diagnose and treat surgical conditions scientifically just as it is the good lawyer's desire to have all parties reach a satisfactory settlement without recourse to the courts.

The operator sees in every patient a prospective operative condition. If in doubt, he does a curettage, repairs a slightly lacerated cervix, removes a harmless appendix, suspends an innocent kidney, resects an ovary for corpus luteum, or if he be a so-called "bold operator," he may even have the temerity to do a gastropexy or excise a colon for vague symptoms. On the contrary, the surgeon places due emphasis upon the importance of a general physical examination followed by a particular investigation of the region toward which symptoms are directed, as well as a routine urinalysis, supplemented by any special laboratory tests that seem indicated. He inspects as carefully as possible the teeth and tonsils of every case and the Wassermann reaction is resorted to almost as routinely as is urinalyis.

The commonest cause of failure in diagnosis is a careless neglect of a routine general physical examination. The first differentiation, then, between operator and surgeon is the matter of painstaking diagnosis. The operator may light-heartedly clip off a negative tube with utter abandon, or rush in for a normal appendix solely on the subjective symptom of pain somewhere in the abdomen. Subsequently, the surgeon in overhauling the thenceforth-branded "neuro," not infrequently discovers a kidney stone, a ureteral stricture, a pyelitis, or perhaps a gastric or duodenal ulcer.

Next in importance is that indefinable *je ne sais quoi* termed surgical judgment which is necessarily coupled with a surgical conscience, namely, an unwillingness on the part of the surgeon to take operative risks when his judgment tells him it jeopardizes the patient's best interests, but utter fearlessness of that bug-bear, "mortality statistics," when delay means certain death and operation offers even a ray of hope of recovery.

Again, the surgeon feels a truly scientific interest in the pathologic diagnosis of the tissues he is forced to remove, whereas the mere operator finds the sponge bucket a shorter cut and a more efficient means of covering over errors of judgment and mistakes in diagnosis.

Finally, mention should be made of the almost obvious fact that fee-splitters are never recruited from the class described here as surgeons, whereas those despicable degenerates who have done so much of late years to discredit the art and science of surgery are to a man mere operators.

Book Reviews

Treatment of Wounds of Lung and Pleura. Based on a Study of the Mechanics and Physiology of the Thorax. Artificial Pneumothorax—Thoracentesis—Treatment of Empyema. By Professor Eugenio Morelli, Assistant in the Medical Clinic of the Royal University of Pavia, Maggiore Medico, Field Hospital No. 79. Translated from the Italian by Lincoln Davis, Formerly Lieutenant-Colonel, M. C., U. S. Army, and Frederick C. Irving, Formerly Major, M. C., U. S. Army. 214 pages. Boston: W. M. Leonard, 1920.

Intellectual interchange with foreign nations is mutually beneficial. The translators consider Morelli's treatment of wounds of this kind novel, simple and painless. They have observed many times its splendid results. The method described "prevents and controls hemorrhage, facilitates the closure and healing of the pulmonary wound, and obviates crippling adhesions." In opposition to the school of radical surgeons, and indeed to most of the profession, he insists that a missile in the tissue of the lungs will cause no trouble if the proper pneumothorax therapy is carried out. He has thought out and successfully applied a fifth form of therapeutic pneumothorax—"a method with special indications and special technic adapted to the treatment of war wounds of the lung and their pleural complications and sequelae."

Laboratory Manual of Pharmacology, Including Materia Medica, Pharmacopaedics and Pharmacodynamics. By A. D. Bush, B.Sc., M.D., Professor of Pharmacology, University of North Dakota. 250 pages, illustrated with full-page plates, many in colors. Philadelphia: F. A. Davis Co.; London: Stanley Phillips, 1919.

This is primarily for the student who intends to practice general medicine, to develop in him powers of systematic and careful observation, and to develop further interest in the subject. It contains four parts: Materia Medica, Pharmacopedics, Pharmacodynamics, and Pharmacology. He attempts to make interesting to students the subject of materia medica, which is usually a bugbear. The book contains blank pages in which the student is to fill in his observations. These are convenient and should save him much time. It is an excellent compilation, boiled down into the least possible number of words and dealing only with the most common and accepted drugs.

Common Diseases of the Skin, with Notes on Diagnosis and Treatment. By J. Gordon Campbell. New York: The Macmillan Co., 1920.

The treatments outlined are admirable. The polypharmacy so noticeable in most texts on the skin is not to be found. It is unfortunate that the author's striving for brevity prevents his giving in more detail what treatment he does suggest. For example, under the treatment of eczema, Ihle's paste is recommended, with the suggestion that salicylic acid may be added. No hint of the strength to be used is given. In other places "mild antiseptic ointments" are suggested for some phases of treatment. In a work as elemental as this it would seem well to be specific. This brevity amounts to a fault in some instances. (See pruritus.)

Without hair-splitting, certain scientific inaccuracies can be pointed out, e. g., page 37, in the description of the treatment of ivy poisoning, the statement is made that alcohol should be used to neutralize the poisonous juice. On page 157 purpura is described as a hemorrhagic disease of the skin. On page 68: "Erythema multiforme is the eruption produced, etc." This last is no doubt the result of careless writing. Erythema multiforme is not infrequently produced by the procedures mentioned, but so are urticaria and eczema lighted up by some of them; and the dermatitis exfoliativa following arsphenamine would be classified by no one as erythema multiforme. For another example of this "careless writing," see page 73: "Treatment is confined to, etc." Immediately below, "salines, etc.," are recommended. With reference to the statement about erythema multiforme, see page 25. Dermatitis Medicamentosa Erup. following typhoid vaccine.

From a literary standpoint nothing kind may be said of the work. Careless inaccuracies abound, such as: "Lupus vulgaris, and an ulcerating tertiary syphilide are the only diseases likely to be confused, etc." (p. 118.) Positive grammatical errors are almost as frequent, e. g., " . . . warm baths with plenty of soap gets rid of them" (p. 105).

The Systematic Treatment of Gonorrhea in the Male. By Norman Lumb, O.B.E., Late R.A.M.C. Specialist in Venereal Diseases, and Officer-in-Charge of Divisions 39 and 51, General Hospital, B.E.F.; Clinical Assistant, St. Peter's Hospital for Stone. Second edition. 123 pages. Philadelphia and New York: Lea & Febiger, 1920.

The wave of sentiment in favor of the eradication of venereal disease has stimulated the writing of books on this subject that present the most salient points without too much detail.

The little volume by Dr. Lumb covers the subject matter admirably without the more detailed and pleasing style of the larger books.

It can be recommended to the medical profession as a guide to treatment.

X-Ray Observations for Foreign Bodies and Their Localization. By Capt. Harold C. Gage, A.R.C.O.I.P., American Red Cross Hospital, Paris. 87 pages, illustrated. St. Louis: C. V. Mosby Co., 1920. Price $1.75.

This monograph is by the recognized expert in localization. His methods are employed generally. Those who wish to learn his technique should have this work to guide them.

Southern Medical News

ALABAMA

At the meeting of the Calhoun County Medical Society, held January 1 at Anniston, the following officers were elected: Dr. C. Hal Cleveland, President; Dr. A. L. Nourse, Vice-President; Dr. Wade H. Brannon, Secretary; Dr. E. C. Anderson, Treasurer.

The Madison County Medical Society held its meeting in Huntsville December 7 and elected the following officers: Dr. Edgar Rand, President; Dr. W. J. Jordan, Vice-President; Dr. I. W. Howard, Censor; Dr. M. M. Duncan, Secretary.

Dr. Burr Ferguson, Birmingham, has left for Holland to serve as Medical Inspector of Immigration at Rotterdam, under the direction of the U. S. Public Health Service.

The Huntsville Rotary Club will donate a fund of $500, which was being held for a proposed memorial hospital, to the Huntsville Hospital.

Drs. Walter A. Weed and Joseph A. Meadows, Birmingham, announce that they have, by mutual agreement, dissolved partnership. Dr. Weed will have offices in the Woodward Building and Dr. Meadows in the Empire Building.

The old medical school building, Mobile, has been offered to the Mobile County Board of School Commissioners by the University of Alabama to be used for educational purposes.

At a meeting of the Mobile County Medical Society held in Mobile December 4, the following officers were elected: Dr. William H. Oates, President; Dr. Edward S. Sledge, Vice-President; Dr. W. W. Scales, Secretary (re-elected); Dr. E. W. Cawthon, Treasurer (re-elected).

Drs. Marcus Skinner, I. C. Skinner, B. B. Rogan and J. H. Martin, Selma, announce that they have purchased the hospital owned and operated by the late Dr. Goldsby King, and will conduct it under the name of the Goldsby King Memorial Hospital.

Dr. Frederick W. Dershimer, Montgomery, has resigned as City and County Health Officer and has been succeeded by Dr. Edward Helwig, Indianapolis.

At the annual meeting of the Birmingham Pathological Society, held in December, Dr. J. R. Bean, Director of the Bureau of Laboratories of the County Board of Health, was elected President; Dr. Cabot Lull, Vice-President; Dr. R. G. Martin, Secretary and Treasurer. The Board of Governors is as follows: Miss Blanche Frazier, Miss Eleanor Hall and Miss Ruth Heaton.

Dr. Mack C. Hawkins, Greenville, has resigned as Medical Inspector of state prisons and convict camps. Dr. Glenn Andrews, Montgomery, State Prison Inspector, will have full charge of all prisons and prison camps, and will be assisted by Dr. C. H. Smith, Camp Physician at Flat Top prison.

The following officers have been elected for the Jefferson County Medical Society: Dr. Frank A. Lupton, President; Dr. Groesbeck Walsh, Vice-President; Dr. J. Ross Snyder and Dr. M. Y. Dabney, Board of Censors.

The Dallas County Tuberculosis Association has been organized at Selma. Special legislation to form a county health unit with a full-time county health officer will be asked for.

Dr. Wyatt Sanford Roberts, Birmingham, and Miss Mary Lucy Dempsey, of Indianapolis, were married on December 29.

Deaths

Dr. Helen Josephine LeMaistre, Tuscaloosa, aged 38, died December 11.

Dr. Abijah Benjamin Bennett, Opelika, aged 64, died November 12.

Dr. Joseph Porter Merrill, Dozier, aged 46, died November 28.

ARKANSAS

At the recent annual meeting of the Garland County Medical Society, Hot Springs, the following officers were elected: Dr. W. H. Deaderick, President; Dr. G. M. Eckel, Vice-President; Dr. O. H. King, Secretary-Treasurer (re-elected); Dr. S. D. Weil, Censor; Drs. G. E. Tarkington, C. E. Garrett, J. M. Proctor, Delegates to State Meeting.

Dr. J. T. Clegg, Siloam Springs, has resigned as a member of the State Board of Health and Dr. Leonidas Kirby, Harrison, has succeeded him.

Officers for the Drew County Medical Society have been elected as follows: Dr. E. R. Cotham, President; Dr. A. S. J. Collins, Vice-President; Dr. F. L. Duckworth, Secretary-Treasurer.

New officers for the Craighead County Medical Society are as follows: Dr. W. W. Jackson, Jonesboro, President; Dr. Floyd Clardy, Jonesboro, Vice-President; Dr. Thad Cothern, Jonesboro, Secretary; Dr. H. A. Stroud, Jonesboro, Treasurer.

The Lawrence County Medical Society met December 3 in Walnut Ridge and elected the following officers: Dr. J. C. Land, President; Dr. J. C. Hughes, Vice-President; Dr. H. R. McCarroll, Secretary and Treasurer.

The Pulaski County Medical Society, Little Rock, held a meeting in December and elected the following officers: Dr. Robert Caldwell, President; Dr. J. B. Dooley, Vice-President; Dr. D. A. Rhinehart, Secretary; Dr. William R. Bathurst, Treasurer.

The First Councilor District Medical Society met in November and the following officers were elected: Dr. W. C. Haltum, Jonesboro, President; Dr. J. C. Swindle, Walnut Ridge, Vice-President; Dr. Thad Cothern, Jonesboro, Secretary and Treasurer.

The Hempstead County Medical Society met at Hope December 17th and elected the following officers: Dr. G. E. Cannon, President; Dr. W. D. Farrow, Vice-President; Dr. W. G. Allison, Secretary.

The Franklin County Medical Society met December 14 and elected the following officers: Dr. S. P. Gammill, Branch, President; Dr. J. M. Powell, Coal Hill, Vice-President; Dr. Thomas Douglass, Ozark, Secretary-Treasurer.

The home of Dr. F. E. Harrison, Fordyce, was destroyed by fire December 11. Practically nothing was saved.

Dr. W. J. William Powell, Russellville, has moved to Detroit, Mich.

Dr. Paul E. Johnson, Helena, has been assigned to the surgical staff of the Public Health Service Hospital at Houston, Tex.

Dr. William C. Vandiver, Mena, and Miss Iva Conseer, Lequire, Okla., married December 3.

Deaths

Dr. Cyrenius William Sillin, Stuttgart, aged 63, died December 18.

Dr. C. C. Brown, Chickalah, aged 74, died December 1.

DISTRICT OF COLUMBIA

New headquarters for the Medical Society of the District of Columbia were formally opened January 12, when its members gave a reception to its President and other officers. The new home is located at 1718 M Street, N. W.

Recently a fire at the Walter Reed General Hospital destroyed two psychopathic wards, which caused the death of one shell-shocked soldier and injury to several others. The loss entailed approximately $25,000.

Two traveling laboratory cars of the U. S. Public Health Service have been assigned to the U. S. Bureau of Mines for aid in mine rescue work. The laboratory car "Hamilton" will be stationed at Terre Haute, Ind., and the "Wyman" will be used for field work.

Dr. Howard Hume and Dr. Henry F. Sawtell, Washington, have resigned as members of the Board of Fire and Police Surgeons and have been succeeded by Dr. Daniel L. Borden and Dr. Christopher J. Murphy.

Deaths

Dr. Richard A. Pyles, Washington, aged 58, died December 5 from heart disease.

Dr. Robert Wade Brown, Washington, aged 58, died November 27.

Dr. Edwin Lee Morgan, Washington, aged 65, died November 23.

Dr. Wm. F. M. Sowers, Washington, aged 46, died December 19.

Dr. John Beale Gardner, Washington, aged 90, died November 18 from pneumonia.

FLORIDA

At the regular meeting of the Hillsborough County Medical Society, at Tampa, early in December, the following officers were elected: Dr. J. C. Vinson, President; Dr. Leland F. Carlton, Vice-President; Dr. C. R. Marney, Secretary; Dr. L. B. Mitchell, Censor.

Dr. Fritz A. Brink, Pensacola, has been elected President of the Escambia County Anti-Tuberculosis Association, and Dr. J. S. Turberville, Century, Vice-President.

If the citizens in Lee County will raise a sum of $5,000 for the erection of a hospital, Mr. and Mrs. Med R. Kellum will donate $5,000 in cash and property valued at $12,000 on McGregor Boulevard, near Fort Myers. The offer must be accepted before January 1, 1922, and the hospital completed within five years.

The laboratory of the State Board of Health at West Palm Peach is under construction. The total cost will be $34,500.

Dr. Harold H. Fox, Miami, announces the location of his offices at 208 Republic Building.

A free hookworm clinic will be opened in the McCaskill Building, Milton, according to an announcement of the State Board of Health.

The new Public Health Hospital at Lake City was formally opened December 6 with Dr. Almon P. Goff, medical officer in charge.

Deaths

Dr. B. Caffee, Tampa, died recently from injuries received in an automobile accident.

GEORGIA

The Decatur-Seminole County Medical Society met in Bainbridge December 29 and elected the following officers: Dr. Gordon Chason, Bainbridge, President; Dr. J. I. Spooner, Donaldsonville, Vice-President; Dr. P. M. Lewis, Bainbridge, Secretary-Treasurer.

At the twentieth semi-annual meeting of the Eleventh District Medical Society, held at Waycross November 9, the following officers were elected: Dr. A. S. M. Coleman, Douglas, President; Dr. S. L. Vinson, Nicholls, Vice-President; Dr. J. W. Simmons, Brunswick, Secretary-Treasurer.

The Association of Seaboard Air Line Railway Surgeons, at their annual meeting in Savannah in December, elected the following officers: Dr. H. C. Dozier, Ocala, Fla., President; Dr. J. W. Palmer, Ailey, Secretary-Treasurer (re-elected). Birmingham, Ala., was selected for the 1921 meeting place.

The Carroll County Memorial Hospital, Carrollton, has been opened. The Hospital is completely equipped and has a capacity of twenty-four beds. The advisory board consists of the following physicians: Dr. H. H. Askew, Dr. H. L. Barker, Dr. H. J. Goodwin, Dr. T. W. Reeves, Dr. C. C. Fitts.

A committee composed of Drs. J. C. Watts and W. J. Shaw, Rome, and Dr. Howard Felton, Cartersville, has been appointed by the Seventh District Medical Society to secure funds for a memorial to Dr. Robert Battey.

A recent gift of $20,000 from Grantham Taggart, Savannah, assures the early erection of a tuberculosis hospital in Savannah on the twenty acre site owned by the Chatham-Savannah Tuberculosis and Benevolent Association. Two huts, costing about $4,000, will be erected by Mr. Taggart and will be dedicated to his children.

The Tuttle-Newton Orphanage at Augusta has been purchased by the State Board of Health to be used as a school for feeble-minded.

Dr. T. D. Coleman announces that he has assumed control and management of the Bad-Nauheim baths, formerly conducted at Summerville by the late Dr. James H. Honan.

Sixty-five rooms are being added to the Piedmont Sanitarium, Atlanta, to meet increased demands on the institution.

Hall County has adopted the Ellis health law and Dr. B. D. Blackwelder has been elected Commissioner of Health for that County.

Seminole County has employed a full-time visiting nurse.

Drs. William C. Pumpelly and George Y. Massenberg, Macon, have under construction a clinic building and sanatorium which will have rooms for twenty-six patients.

Dr. Joseph Campbell Bennet, Brunswick, and Miss Virginia Hansbrough Iden, Manassas, Va., were married November 24.

Dr. James Calhoun McDougall and Miss Josephine Stoney, both of Atlanta, married December 29.

Deaths

Dr. John L. Farmer, Savannah, aged 56, died early in December.

Dr. Vincent D. Lockhart, Maysville, aged 71, died at the Hardman Sanatorium, Commerce, November 14 from carcinoma.

Dr. L. P. Harrington, Waynesboro, aged 60, died November 6.

Dr. Charles H. Raley, Wrens, aged 67, was killed by a passenger train while crossing the track November 30.

KENTUCKY

The State Board of Charities and Corrections has appointed a consultant staff of specialists to visit the state institutions when their services are needed. The staff is as follows: Dr. Irvin Abel, surgery; Dr. Sidney Meyers, medicine; Dr. S. S. Watkins, eye; Dr. John Moran, neurology; Dr. Stuart Graves, laboratory; Dr. Arthur McCormack, preventive medicine; Dr. George H. Day, urology and syphilis.

Dr. John H. Blackburn, Bowling Green, will convert his two-story brick residence at 1119 State Street into a hospital. Only surgical cases will be treated and graduate nurses employed. The hospital will accommodate twelve patients.

Dr. Hiram Eggers, Louisville, has been appointed Assistant City Health Officer.

At the annual meeting of the Jefferson County Medical Society, Louisville, held in December, the following officers were elected: Dr. J. K. Freeman, President; Dr. E. T. Grasser, First Vice-President; Dr. Robert Pirtle, Second Vice-President; Dr. John H. Richardson, Treasurer; Dr. C. G. Arnold, Secretary.

New officers for the Hardin County Medical Society are as follows: Dr. J. C. Mobley, President; Dr. S. L. Stull, Vice-President; Dr. D. E. McClure, Secretary-Treasurer.

At the recent meeting of the Kappa Psi Medical Fraternity, Louisville, the following officers were elected: Dr. James D. Reeder, Baltimore, Regent; Dr. Victor J. Anderson, Chicago, Vice-Regent; Dr. Watson W. Eldridge, New York, Secretary-Treasurer.

It is understood that in the near future the Mason Memorial Hospital at Murray will be opened. The hospital will have accommodations for 150 patients.

At the meeting of the Todd County Medical Society, held in Elkton December 1, the following officers were elected: Dr. R. L. Boyd, Allensville, President; Dr. B. E. Boone, Elkton, Vice-President; Dr. W. E. Bartlett, Elkton, Secretary-Treasurer.

Deaths

Dr. S. LaRue Helm, Lexington, aged 66, died at a hospital in Baltimore December 9, following an operation.

Dr. Forrest L. Lightfoot, Cloverport, aged 44, died December 6 from heart disease.

Dr. John Franklin Adams, Shelbyville, aged 62, died January 1 after an illness of several weeks.

Dr. R. N. Dawson, Bowling Green, aged 76, died recently of apolexy.

LOUISIANA

Dr. Warren P. Morrill has been appointed Superintendent of the Charity Hospital at Shreveport. He was formerly Superintendent of the University Hospital, Augusta, Ga

At a recent meeting of the Orleans Parish Medical Society, New Orleans, the following officers were elected: Dr. Stephen M. Blackshear, President; Drs. William H. Black, William H. Harris and Frank R. Gomilla, Vice-Presidents; Dr. Elizabeth Bass, Secretary; Dr. John A. Lanford, Treasurer.

Dr. E. E. Evans has been appointed Superintendent of the East Louisiana Hospital for the Insane at Jackson.

Dr. Edmund L. Leckert, New Orleans, has been appointed Secretary-Treasurer and Sanitary Officer of the City Board of Health.

At the annual meeting of the Ouachita Parish Medical Society, held at Monroe early in December, the following officers were elected: Dr. Courtland P. Gray, President; Dr. George W. Wright, Vice-President; Dr. James E. Walsworth, Secretary-Treasurer.

The new tuberculosis sanatorium at New Pines, near Shreveport, was formally opened December 4. The sanatorium and other buildings in connection with same cost more than $100,000 and includes a cottage donated by the Standard Oil Company of Louisiana. Col. J. B. Ardis donated the grounds, which comprise 54 acres.

Dr. John Callan, New Orleans, has been appointed Superintendent of the City Board of Health.

The Caddo Parish Board of Health, Shreveport, has taken over the narcotic clinic formerly conducted at the Schumpert Sanatorium by Dr. Willis P. Butler.

Thirty-two cases of hydrophobia have been reported at Church Point. These persons are under treatment at the Charity Hospital in New Orleans. It is believed that the disease was contracted from a horse treated for hydrophobia.

Deaths

Dr. Francis James Kearny, Plaquemine, aged 60, died suddenly December 2 from angina pectoris.

Dr. Emanuel Dreifus, New Orleans, aged 70, died early in December.

Dr. A. Pierre Sillan, St. Martinville, aged 54, died November 22.

MARYLAND

A group of Bohemian physicians recently spent several days in Baltimore studying methods employed in the clinics of Johns Hopkins Hospital.

Plans have been completed for the reconstruction of Johns Hopkins Hospital, which will cost about $11,500,000, including $6,750,000 as a permanent endowment fund. The pathologic building, to cost $600,000, will be built first. This to replace the building destroyed by fire last winter.

Work on an addition to the University of Maryland Hospital, on Lombard Street, will probably be begun in the spring.

Dr. J. Whitridge Williams, Baltimore, has resigned as a member of the Board of Supervisors of City Charities and has been succeeded by Dr. Robert P. Bay, formerly medical examiner for the State Industrial Accident Commissions and Superintendent of University Hospital.

The fifth annual session of the American Congress on Internal Medicine will be held at Baltimore February 21-26. Activities of the Congress will be largely clinical. Wardwalks, laboratory demonstrations and group or amphitheater clinics will be conducted daily by members of the faculties of Johns Hopkins and the Maryland Universities. For further information address the Secretary-General, 1001 North Dearborn Street, Chicago, Ill.

Dr. Henry Martin Field and Miss Florence Marion Cassidy, both of Princess Anne, were married December 15.

Capt. Henry W. Kennard, M.C., U. S. Army, Baltimore, and Miss Elsie Wilson Hunter, Richmond, Va., were married December 11.

Deaths

Dr. Robert Stevens Page, Bel Air, aged 46, died at the Union Memorial Hospital, Baltimore, December 2.

Dr. John Davis, Baltimore, aged 63, died December 14 from paralysis.

Dr. George W. Simmons, Denton, aged 76, died at the home of his son in Chestertown November 20.

Dr. John M. Duvall, Springfield, died December 3.

MISSISSIPPI

Drs. Paul D. Hardin and Lawrence B. Hudson, Hattiesburg, have been appointed resident managers of the King's Daughters' Hospital, Hattiesburg.

Dr. David Walley, Richton, has resigned as a member of the State Board of Health for the Sixth District and has been succeeded by Dr. Evan M. Gavin, Ovette.

Deaths

Dr. Joseph W. Hough, Jackson, aged 92, died December 11.

Dr. James R. S. Pitts, Waynesboro, aged 67, died December 22.

(Continued on page 38)

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(Continued from page 180)

MISSOURI

The Butler-Stoddard County Medical Society met in Poplar Bluff in December and elected the following officers: Dr. J. B. Eure, President; Dr. C. W. Winson, Vice-President; Dr. W. L. Brandon, Secretary; Dr. J. W. McPheeters, Treasurer.

The following officers have been elected for Callaway County Medical Society: Dr. J. B. McCubbin, President; Dr. A. D. Ferguson, Vice-President; Dr. M. Yates, Secretary-Treasurer.

New officers for the St. Louis Medical Society are as follows: Dr. Emmett P. North, President; Dr. Malcolm A. Bliss, First Vice-President; Dr. Charles E. Hyndman, Second Vice-President; Dr. John W. Stewart, Secretary.

The following officers have been elected for Jackson County Medical Society: Dr. G. E. Bellows, President; Dr. F. C. Neff, Vice-President; Dr. Paul V. Woolley, Secretary (re-elected); Dr. W. F. Kuhn, Treasurer (re-elected).

New officers for Randolph County Medical Society are as follows: Dr. R. A. Wood, Clark, President; Dr. F. L. McCormick, Moberly, Vice-President; Dr. C. H. Dixon, Moberly, Secretary-Treasurer.

The Cass County Medical Society met in Harrisonville December 9 and elected the following officers: Dr. W. F. Chaffin, Raymore, President; Dr. R. D. Ramey, Garden City, First Vice-President; Dr. M. P. Overholser, Harrisonville, Second Vice-President; Dr. H. S. Crawford, Harrisonville, Secretary-Treasurer.

The Wright-Douglas County Medical Society met in Mansfield November 4 and elected the following officers for 1921: Dr. J. A. Fuson, President; Dr. R. M. Norman, Vice-President; Dr. A. C. Ames, Secretary-Treasurer.

The Webster County Medical Society met in Fordland December 15 and elected the following officers: Dr. E. M. Bailey, President; Dr. W. A. Atkins, Vice-President; Dr. John R. Bruce, Secretary-Treasurer.

Dr. J. W. Campbell has been appointed Health Officer of St. Louis.

Dr. H. E. Pearse, Kansas City, was elected Vice-President of the Western Surgical Association at their recent meeting in Los Angeles.

(Continued on page 40)

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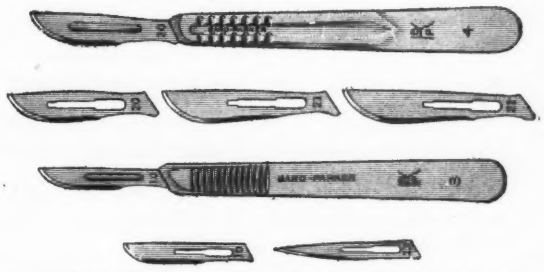

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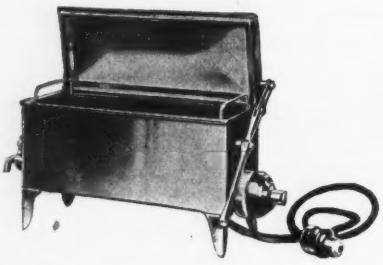

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(Continued from page 38)

The Audrian Hospital, Mexico, was formally opened December 16.

The new St. Luke's Hospital, located on a four-acre tract on Mill Creek Parkway, Kansas City, is under construction.

The Audrian County Medical Society met in Mexico the latter part of December and elected the following officers: Dr. R. W. Berrey, President; Dr. J. F. Jolley, Vice-President; Dr. J. E. Miller, Secretary-Treasurer; Dr. R. S. Williams, Censor.

The Greene County Medical Society has elected new officers as follows: Dr. Joseph D. James, President; Dr. M. S. Stone, Vice-President; Dr. Robert Glenn, Secretary; Dr. W. E. Handley, Treasurer; Dr. W. R. Batie, Censor.

The St. Louis University has secured Dr. John Auer, Pharmacologist of the Rockefeller Institute, to establish and conduct a Department of Pharmacology in the medical school.

The Medical School of Washington University, St. Louis, will soon offer short courses, from six to sixteen weeks, in medicine, surgery, gynecology, obstetrics, neurology, urology, orthopedic surgery, pediatrics, ophthalmology, laryngology, otology, surgical pathology and roentgenology. The courses will begin about April.

Dr. Hugo Muench and Miss Helen Ruth Harrison, both of Carthage, married December 28.

Deaths

Dr. Frank Ring, St. Louis, aged 65, died November 19 from endocarditis.

Dr. Philip Cogan, St. Louis, died December 8.

Dr. George Oliver Coffin, Kansas City, aged 42, died at the Bonner Springs Sanitarium December 11.

Dr. G. H. Cox, Joplin, aged 83, died December 20.

Dr. Francis McCabe, Palmyra, aged 91, died November 15 from nephritis.

Dr. Joseph J. Houwink, St. Louis, aged 46, died suddenly December 22.

NORTH CAROLINA

The Scotland County Medical Society met at Gibson January 3 and elected officers as follows: Dr. N. C. Hunter, Laurinburg, President; Dr. John S. Gibson, Gibson, Vice-President; Dr. Fairley James, Laurinburg, Secretary.

The twenty-fifth annual meeting of the Seaboard Medical

(Continued on page 42)

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(Continued from page 40)

Association of Virginia and North Carolina was held in Elizabeth City December 7-9. The following officers were elected: Dr. E. C. S. Taliaferro, Norfolk, Va., President; Dr. Jos. L. Spruill, Sanatorium, Dr. Joseph T. Buxton, Newport News, Va., Dr. T. S. McMullen, Elizabeth City, and Dr. A. M. Burfoot, Fentress, Va., Vice-Presidents; Dr. Geo. A. Caton, New Bern, Treasurer; Dr. Clarence Porter Jones, Newport News, Va., Secretary.

The Surry County Medical Society met in Mt. Airy December 14 and elected officers as follows: Dr. M. A. Royall, President; Dr. E. M. Hollingsworth, Vice-President; Dr. Moir S. Martin, Secretary-Treasurer.

At a meeting of the Cabarrus County Medical Society on December 8 the physicians' fees for professional services were reduced to the same rate as existed during the first of the year. The following officers were elected: Dr. J. A. Hartsell, President; Dr. P. R. McFadyen, Vice-President; Dr. J. F. Reed, Secretary-Treasurer.

The Clarence Barker Memorial Hospital, Biltmore, was partially destroyed by fire January 2. Plans are already being made to erect a new hospital to cost $250,000. This hospital was built in 1899 by the late Geo. W. Vanderbilt as a memorial to his cousin, Clarence Barker.

Dr. L. B. McBrayer, Superintendent of the State Sanatorium for Tuberculosis, has announced that the State Board of Health, the American Red Cross and the North Carolina Tuberculosis Association have arranged to carry the services of the free diagnostic clinic, which has been conducted at Sanatorium for some time, to various parts of the State.

New officers elected for Vance County Medical Society at a meeting held December 18 are as follows: Dr. F. R. Harris, President; Dr. E. F. Fenner, Vice-President; and Dr. J. H. Wheeler, Secretary-Treasurer.

Dr. Edwin J. Kehoe has resigned as Health Officer for Henderson and Vance Counties and has been succeeded by Dr. R. S. Bailey, of Orangeburg, S. C.

Dr. A. C. Bulla has been re-elected Health Officer of Forsyth County.

It has been announced that the Baptist Hospital will be located at Winston-Salem. The city has offered a site of 13 acres, with a bonus of $100,000 in cash.

New officers for Martin County Medical Society are as follows: Dr. Wm. H. Harrell, President; Dr. Godwin, Vice-President; and Dr. Wm. E. Warren, Secretary-Treasurer.

The Alamance County Medical Society met in Graham early in December and elected the following officers: Dr. J. R. Parker, President; Dr. W. R. Goley, Vice-President; and Dr. J. C. Joyner, Secretary-Treasurer.

At the regular meeting of the McDowell County Board of Health held January 3 in Marion, Dr. G. S. Kirby was re-elected County Health Physician, and Dr. J. B. Johnson, Old Fort, was elected County Quarantine Officer.

The Franklin County Medical Society met in Louisburg December 22 and elected the following officers: Dr. B. C. Johnson, President; Dr. H. M. Beam, Vice-President; and Dr. H. H. Johnson, Secretary-Treasurer.

New officers for Davidson County Medical Society are as follows: Dr. C. A. Julian, Thomasville, President; Dr. Frank L. Mock, Reeds, Vice-President; and Dr. R. V. Yokley, Lexington, Secretary.

New officers for Forsyth County Medical Society are as follows: Dr. V. M. Long, President; Dr. Joseph F. Belton, Vice-President; and Dr. S. W. Hurdle, Secretary-Treasurer.

Dr. Joseph Anderson Speed and Miss Gladys Hunt Gorman, both of Durham, married November 10.

Dr. James Yates Hamerick, Boiling Springs, and Miss Marjorie Pierce, Whiteville, married December 14.

Deaths

Dr. A. G. Floyd, Fair Bluff, died recently.

Dr. Alexander Franklin Jones, Cameron, aged 29, was killed instantly December 10, when his automobile was struck by a passenger train at a grade crossing.

Dr. John P. Donovan, Lovington, aged 84, died early in December.

Dr. Alvah Giles Floyd, Fair Bluff, aged 60, died December 14 from cerebral hemorrhage.

OKLAHOMA

Plans are on foot to build a new hospital at Ada to be known as St. Joseph's Hospital. The hospital will have accommodations for seventy beds, and the cost of construction is estimated at $50,000.

Plans have been completed to build a three-story annex to the University Hospital, Enid.

The first open air school was opened in Oklahoma City in November at Willard School. There were 16 pupils in attendance. The City Tuberculosis Society furnishes the cots, blankets, open air garments, food for lunches and a nurse attendant.

The State Medical Association will be held at McAlester May 17-19.

(Continued on page 44)

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New Orleans

(Continued from page 42)

The Muscogee County Medical Society met December 13 and elected the following officers for 1921: Dr. F. W. Ewing, President; Dr. C. M. Fullenwider, Vice-President; Dr. A. L. Stocks, Secretary; and Dr. J. T. Nichols, Censor.

Dr. W. A. Logan, Lehigh, has removed to Oklahoma City.

In December the Picher Hospital, Picher, was partially destroyed by fire.

A contract for the construction of the buildings for the State Tuberculosis Sanatorium at Talihina has been awarded. An appropriation of $100,000 was made by the Legislature.

Dr. C. W. Austin, Brinkman, has removed to Mangum.

The Garfield County Medical Society has elected the following officers for 1921: Dr. James H. Hays, President; Dr. Percy A. Smithe, Vice-President; and Dr. Frank Glenn Francisco, Secretary-Treasurer.

Dr. C. A. Johnson, Kiowa, has removed to Wilson.

The Oklahoma Public Health Association and the University of Oklahoma have made arrangements for the distribution of slides, moving picture films and standard lectures on public health topics.

Dr. J. T. Wharton, Picher, has removed to Miami.

Dr. O. W. Starr, Drumright, and Miss Lois Winn, Lawton, were married October 6.

Deaths

Dr. Charles M. Hamilton, Holdenville, aged 64, died November 15 from cerebral hemorrhage.

Dr. John F. Huddleston, Enid, died recently.

SOUTH CAROLINA

The Anderson County Medical Society met in Anderson December 8 and elected officers as follows: Dr. H. H. Acker, President; Dr. E. E. Epting, Vice-President; and Dr. H. M. Daniel, Secretary-Treasurer.

Dr. Percy H. Brigham, New Orleans, La., has been appointed Health Commissioner of Orangeburg.

On December 1 fire practically destroyed two wards of the U. S. Public Health Service Hospital at Camp Sevier. The seventy patients in the Hospital at the time were safely removed from the building without injury.

The Salvation Army Hospital, Greenville, erected at a cost of approximately $250,000, and intended to serve the southeastern section of the country, was dedicated January 13. This is the fourth hospital established by the Salvation Army in the United States.

Dr. Robert S. Bailey has resigned as Health Officer of Orangeburg County and has been succeeded by Dr. D. D. Bulloch, of Roland, N. C.

Deaths

Dr. Hugh Aiken, Abbeville, died early in January.

TENNESSEE

Dr. Willis C. Campbell, Memphis, announces the removal of his offices and clinic to his new building, 869 Madison Avenue.

Dr. William G. Saunders, Jackson, has been appointed surgeon for the Jackson Division of the Mobile & Ohio Railroad to succeed the late Dr. Ambrose McCoy.

Dr. J. F. Ward, Memphis, has resigned as Medical Director of General Hospital, and is succeeded by Dr. L. S. Neasy.

The Maury County Medical Society met early in December and elected the following officers for 1921: Dr. George Williamson, Columbia, President; Dr. J. C. Morrison, First Vice-President; Dr. R. S. Perry, Second Vice-President; and Dr. M. A. Beasley, Secretary-Treasurer.

Drs. Frank D. Smythe and Frank W. Smythe announce the formation of a partnership with offices in the Exchange Building, Memphis. Practice limited to surgery.

New officers for the Memphis and Shelby County Medical Society are as follows: Dr. W. G. Somerville, President; Dr. J. J. Hobson, Vice-President; Dr. Percy H. Wood, Secretary; and Dr. Carroll Turner, Treasurer.

Dr. L. V. Frazier, Trenton, has removed to Brazil, Tenn.

Dr. S. L. Mackey, Gann, has removed to Bradford.

Dr. J. J. Lentz has been elected Health Officer of Davidson County to succeed Dr. John R. Thompson, deceased.

Deaths

Dr. Ambrose McCoy, Jackson, aged 62, died December 26.

Dr. William Dickle Richmond, Knoxville, aged 47, died December 18.

Dr. Sam W. McFarland, Lebanon, aged 40, died December 15 from cerebral hemorrhage.

Dr. James Burrow, Bristol, aged 26, died in the Government Hospital, Ancon, December 5 from cirrhosis of the liver.

Dr. Alexander Lovette Walker, Estill Springs, aged 42, died December 19.

Dr. James Druery Boyce, Memphis, aged 65, died November 12 from cerebral hemorrhage.

(Continued on page 46)

The Diet in Typhoid

and other fevers and diseases

prevalent at this season

As the intestinal tract is seriously involved in Typhoid fever, the dietetic problem is one of first consideration. A liquid diet is largely essential, in which connection "Horlick's" has important advantages, being very palatable, bland, and affording the greatest nutriment with the least digestive effort.

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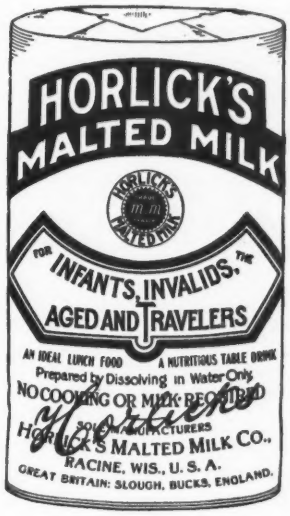
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(Continued from page 44)

Dr. Cyrus M. Stewart, Memphis, aged 89, died December 6 from pneumonia.

Dr. James A. P. Knox, Memphis, aged 89, died December 1.

Dr. John Lehman Smith, Nashville, aged 23, died in the Woman's General Hospital December 22.

Dr. A. R. McNeil, Big Richmond, died recently.

TEXAS

The Lampasas County Medical Society met at Lampasas on December 13 and elected the following officers for 1921: Dr. J. D. Dorbandt, President; Dr. D. W. Black, Vice-President; and Dr. J. G. Townsen, Secretary-Treasurer.

On December 11 the directors of the Texas Baptist Memorial Sanitarium and the trustees of Baylor University held a joint meeting at Dallas and perfected plans for the Sanitarium to be conducted as a unit of Baylor University. The Sanitarium will be known as Baylor Hospital and will be under the direction of the Board of Trustees of the University.

At the recent meeting of the Tri-State Society of Texas, Arkansas and Louisiana, the following officers were elected: Dr. Frank Walke, Shreveport, La., President; Dr. L. J. Kosminsky, Texarkana, Ark., Dr. S. A. Collom, Texarkana, Tex., Dr. J. A. Hendricks, Shreveport, La., Vice-Presidents; Dr. Nettie Klein, Texarkana, Tex., Secretary-Treasurer; and Dr. J. S. Hesterly, Prescott, Ark., Dr. W. G. Allen, Converse, La., and Dr. Frank J. Littlejohn, Shreveport, La., Councilors. Next meeting to be held in Shreveport December, 1921.

Several cases of a mild form of typhus fever were recently reported from Temple.

The Bastrop County Medical Society met at Bastrop December 2 and elected the following officers: Dr. I. J. Dawson, Bastrop, President, and Dr. T. B. Taylor, Bastrop, Secretary-Treasurer (re-elected).

Drs. J. E. Clarke, William P. Lee and Kincy J. Scott have been elected as members of the Cisco City Board of Health.

New officers for Harrison County Medical Society are as follows: Dr. C. R. Hargrove, President; Dr. J. B. Baldwin, Vice-President; and Dr. M. H. Wheat, Secretary-Treasurer.

Dr. Manton M. Carrick, Dallas, has been appointed State Health Officer.

(Continued on page 48)

The fury of the jury—

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"The juries have simply gone crazy about large verdicts; seeming to vie with each other to see who can give the biggest verdict."

Juries Gone Wild

"The juries at this term of court have gone absolutely wild. It seems that there is a kind of bolshevism, or something of that kind, pervading the minds of the jury."

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(Continued from page 46)

The Williamson County Medical Society met at Georgetown on December 9 and elected the following officers: Dr. E. W. Stromberg, Taylor, President; Dr. J. R. Martin, Georgetown, Vice-President; and Dr. W. G. Pettus, Georgetown, Secretary.

Miss Inez Newman, advisory nurse of the Bureau of Child Hygiene of the State Health Department, has resigned to do mental hygiene work in Mississippi.

Deaths

Dr. Samuel Eugene Shelton, Waco, aged 69, died December 20.

Dr. Samuel Corley, Clarksville, aged 57, died November 27 from cerebral hemorrhage.

Dr. John Irving Fort, Dallas, aged 69, died December 15.

Dr. J. B. Moore, McGregor, aged 42, died December 25.

Dr. S. B. Hollar, Midlothian, aged 85, died early in December.

Dr. E. W. English, Slayden, died recently.

VIRGINIA

At a recent meeting of the Warwick County Medical Society held in Newport News, the following officers were elected: Dr. F. A. Sinclair, President; Dr. D. W. Draper, Vice-President; and Dr. W. O. Poindexter, Secretary.

The Richmond Academy of Medicine has elected officers as follows: Dr. T. D. Jones, President; Dr. R. D. Garcin, First Vice-President; Dr. R. W. Miller, Second Vice-President; Dr. J. M. Hutcheson, Third Vice-President; Dr. Mark W. Peyser, Secretary; Dr. E. H. Terrell, Assistant Secretary; Dr. Howard Urbach, Treasurer; and Dr. G. Paul LaRoque, Librarian.

Dr. John C. Phipps, Monorat, is now located at Edgewater, N. J.

Dr. Ennion G. Williams has been reappointed State Health Commissioner for four years.

The following officers have been elected for Luenburg County Medical Society: Dr. H. T. Hawkins, Kenbridge, President; Dr. E. M. Mann, Kenbridge, Vice-President; and Dr. Robert Whitehead, Meherrin, Secretary-Treasurer.

The Pittsylvania County Public Health Association was recently organized at Chatham.

On February 15 a campaign for a fund of $150,000 for the erection of a new addition to the Roanoke Hospital and additional equipment will be inaugurated.

New officers for the Warren-Rappahannock-Page County Medical Society are: Dr. E. G. Brumback, Luray, President; Dr. George H. Long, Luray, Vice-President; Dr. F. L. Smith, Stanley, Secretary-Treasurer.

Under the Presidency of Prof. C. D. Hart, of William and Mary College, the James City and County Public Health Association was organized at Williamsburg.

New officers of the Arlington County Medical Society are as follows: Dr. R. N. Sutton, Clarendon, President; Dr. W. C. Welburn, Ballston, Vice-President; and Dr. B. H. Swain, Ballston, Secretary-Treasurer.

It has been announced that arrangements have been completed for the erection of a $50,000 tuberculosis hospital at Danville, to be known as the Hilltop Anti-Tuberculosis Hospital.

On December 24 fire completely destroyed the offices and laboratory of Dr. J. A. Waddel, Professor of Pharmacology, and a part of the physiologic laboratory at the University of Virginia, Charlottesville.

(Continued on page 50)

CLASSIFIED ADVERTISEMENTS

REGISTERED NURSE with two years' experience as x-ray technician desires position as technician in hospital or doctor's office. South preferred; available immediately. Address M. M., care Journal.

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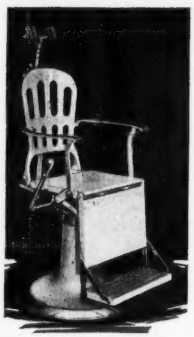

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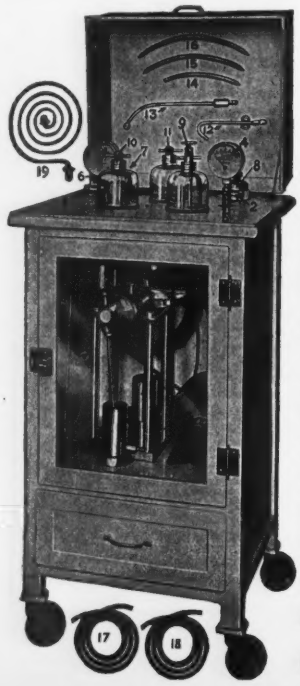

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(Continued from page 48)

The State Public Health Association held a meeting December 28 to January 1 in Richmond.

At the twenty-fifth annual meeting of the Seaboard Medical Association of Virginia and North Carolina, in Elizabeth City, N. C., December 7-9, the following officers were elected: Dr. E. C. S. Taliaferro, Norfolk, President: Drs. Jos. L. Spruill, Sanatorium, N. C., Jos. T. Buxton, Newport News, T. S. McMullen, Elizabeth City, N. C., and A. M. Burfoot, Fentress, Vice-Presidents; Dr. George A. Caton, New Bern, N. C., Treasurer; and Dr. Clarence Porter Jones, Newport News, Secretary.

On December 14 the Southside Virginia Medical Association held its sixty-eighth quarterly meeting in Suffolk. The following officers were elected: Dr. E. L. Kendig, Victoria, President; Drs. T. M. Raines, Wakefield, John M. Williams, Petersburg, E. M. Mann, Kenbridge, and W. C. Harman, Dolphin, Vice-Presidents; and Dr. R. L. Raiford, Sedley, Secretary-Treasurer (re-elected).

Dr. J. R. Blair, Richmond, has bought the Hygiea Hospital owned by Dr. J. Allison Hodges, which will be conducted as a general hospital.

Mrs. E. P. Hairston, Martinsville, has donated a large tract of land to the City for a new hospital. The hospital she donated two years ago was destroyed by fire.

Plans are being completed for changes at the City Hospital, Lynchburg, which will segregate the negroes entirely, accommodate more patients and provide for tuberculars.

The Tri-State Medical Association of Virginia and the Carolinas will meet at Spartanburg, S. C., February 16-17.

The Shenandoah Valley Medical Association was organized in December at a meeting held in Harrisonburg. The following officers were elected: Dr. Marshall J. Payne, Staunton, President; Drs. C. E. Conrad, Harrisonburg, P. W. Boyd, Winchester, W. F. Driver, New Market, Vice Presidents; Dr. A. C. Byers, Harrisonburg, Secretary; and Dr. J. M. Biedler, Harrisonburg, Treasurer.

Under the sponsorship of the South Atlantic Field Y. W. C. A. a nurses' Club has been formed at Stuart Circle Hospital, Richmond. The club, with an initial membership of thirty-five, is the first to be formed in the South Atlantic field.

It is reported that the Winchester Memorial Hospital, Winchester, during the fiscal year which ended November 25, treated a total of 1,429 patients. The operating expenses were nearly $43,000.

Dr. Edward Latane Flanagan and Miss Louise Williams, both of Richmond, married November 23.

Dr. Edward Sandidge, Amherst, and Miss Vera Tignor, Portsmouth, married November 27.

Deaths

Dr. Robert Doran, Winchester, aged 52, died December 11, from Bright's disease and valvular heart trouble.

Dr. James Burrow, Bristol, aged 26, died in a hospital at Ancon, Panama, from cirrhosis of the liver.

Dr. Godfrey L. Miller, Winchester, aged 83, died December 2.

Dr. Charles A. Labenberg, Richmond, aged 44, died December 16.

Dr. James C. Meredith, aged 72, died in the Eye, Ear, Nose and Throat Hospital, Washington, D. C., September 22, following an operation for appendicitis.

Dr. J. R. Spencer, Hollins, aged 56, died early in December.

Dr. Peyton B. Green, Wytheville, aged 59, died December 21 from apoplexy.

(Continued on page 52)

Pat. Pend'g

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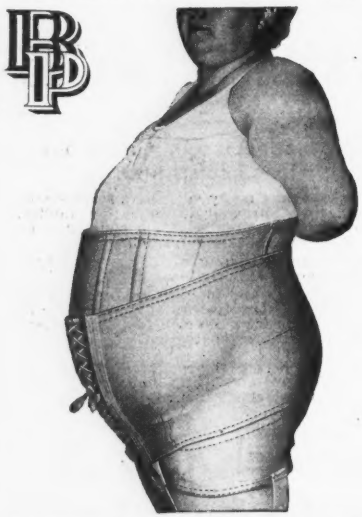

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(Continued from page 50)

WEST VIRGINIA

The Marion County Medical Society met in Fairmont December 28 and elected the following officers for 1921: Dr. L. D. Howard, President; Dr. H. S. Keister, Vice-President; Dr. C. W. Waddell, Treasurer; and Dr. James B. Chilton, Secretary.

Dr. R. H. Paden, formerly of Akron, Ohio, has moved to Parkersburg.

The staff of the Cook Hospital, Fairmont, is announced as follows: Dr. H. H. Carr, Surgical; Dr. C. W. Waddell, Medical; Dr. C. S. Fleming, Obstetrics and Gynecology; Dr. C. L. Holland, Pediatrics; Dr. J. B. Clinton, Gastro-Enterology; Dr. H. S. Keister, Genito-Urinary Surgery; Dr. L. D. Norris, Anesthetics; Dr. H. R. Johnson, Eye, Ear, Nose and Throat; Dr. H. H. Carr, X-Ray; and Dr. C. W. Waddell, Pathology.

Dr. O. L. Hudkins, Flatwoods, has removed to Weston.

Dr. J. M. Teter, Riverton, has removed to Huntington.

At a recent meeting of the West Virginia Tuberculosis Association Dr. George H. Barksdale, Charleston, was elected President.

Deaths

Dr. Otto F. Richter, White Sulphur Springs, aged 57, died November 10.

Dr. Edgar U. Parsons, Piedmont, aged 82, died December 20.

Dr. C. Herbert Thompson, Bluefield, aged 33, died December 14 from injuries when his automobile was struck by a street car.

Dr. Montgomery W. Glass, Beech Bottom, aged 66, died December 17.

Dr. George F. C. Yost, Riverville, aged 44, died October 23 from injuries received in an automobile accident.

GENERAL

The management of the Oconomowoc Health Resort, Oconomowoc, Wis., announces the opening of two new buildings, one for chronic nervous cases and the other is an isolated building for "rest cure" patients. The latter units conform in construction to the previous ones, being absolutely fireproof. The classification of patients is complete in every respect.

The fifth annual session of the American Congress on Internal Medicine will be held at Baltimore, Md., February 21-26. Activities of the Congress will be largely clinical. Ward-walks, laboratory demonstrations and group or amphitheater clinics will be conducted daily by members of the faculties of the Johns Hopkins and the Maryland Universities. For further information address the Secretary-General, 1002 N. Dearborn Street, Chicago, Ill.

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Adrenalin in Medicine

6—In Endocrinology

THE action of Adrenalin is so fleeting as to narrow the scope of its utility in organotherapy. Its important place in clinical endocrinology is that of a diagnostic indicator of deviations from the normal secretory activity of certain glands.

Hyperthyroidism can be detected by the Goetsch test. This test is based on the fact that thyroid secretion sensitizes the sympathetic nerve endings to the action of Adrenalin. The technique consists of the subcutaneous injection of 0.5 cc Adrenalin 1:1000 and the subsequent observation of objective and subjective phenomena.

Blood-pressure readings are taken over a period of one and one-half hours at intervals varying from two and one-half minutes at the beginning of the reaction to ten minutes at the end. In positive cases the systolic blood-pressure rises at least ten points during the first fifteen minutes with an accompanying increase of about ten beats a minute in the pulse-rate. Soon there is noted a slight fall in systolic pressure and then a secondary rise. In about ninety minutes the blood-pressure is back to normal. The subjective symptoms are sometimes striking. There are heart consciousness, apprehension, and marked tremor and pallor occasionally followed by flushing and sweating. The greatest diagnostic importance of the Goetsch test is in distinguishing cases of mild hyperthyroidism from those of incipient tuberculosis.

A satisfactory test for suprarenal function can be performed by injecting subcutaneously fifteen to twenty minims of Adrenalin 1:1000 and estimating the consequent variations in blood sugar. In cases of suprarenal irritability there is an increase in blood sugar which comes on in about thirty minutes and lasts for several hours. A transient glycosuria may likewise be noted.

Loewi's test for pancreatic diabetes is dependent upon the fact that the suprarenal glands and the pancreas are physiological antagonists. In pancreatic diabetes there is impairment if not destruction of the secretory cells which allows certain Adrenalin effects to be more pronounced. One or two drops of Adrenalin 1:1000 should be instilled into one eye. In positive cases—cases of pancreatic insufficiency—there will be a prompt dilatation of the pupil.

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